# Construction Methods AND EQUIPMENT

**JUNE, 1959** 

PRICE \$1.00

A M c G R A W - HILL PUBLICATION



Calcium-chloride-stabilized base material pours out of a continuous pugmill mixing plant at the rate of 370 tons per hour. The plant is producing 62,000 tons for a 4-mile Maryland highway job.

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# "A man who has scrapers can really lower his costs by using Yellow Strand POWERSTEEL!"

POWERSTEEL!"

tion of rope before it even begins to wear e

C. H. Burns & Son, Dallas, Texas, had rope trouble. Here's their story: "Before starting to use 'POWER-STEEL,' we tried six different brands of rope and found none of them satisfactory. On one job we spent over \$600 on rope in less than two months. Many times we would pull a brand new cable in two on the second load.

"We started using 'POWERSTEEL' exclusively in February, 1958, and haven't broken a cable since. I'd say you will get over 150 hours use from a section of rope before it even begins to wear enough to pull through the cable control unit. A man who has scrapers can really lower his costs by using 'POWER-STEEL.' His savings in downtime alone will more than pay for all of his cable."

Dallas, Texas

"POWERSTEEL" can cut your job operating costs, too, because of its greater strength and longer life. Call your Yellow Strand Distributor today! Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.



B.F.Goodrich



# **B.F.**Goodrich tires help contractor speed rugged construction of Glen Canyon Dam

MIGHTY Glen Canyon Dam—world's third highest—will tower 700 feet above the bedrock of the Colorado River in northcentral Arizona. Before this massive project can be completed, millions of tons of rock, sandstone, aggregate and other materials must be moved over rocky haul roads.

To help keep this rugged job on schedule, Merritt-Chapman & Scott Corporation, general contractor, relies on B.F.Goodrich tires and service—uses 47 different types and sizes of tires on 23 different types of equipment that work 'round the clock. For example, M-C&S uses B.F.Goodrich Rock Service tires on belly dump trucks (above).

B.F.Goodrich builds the Rock Serv-

ice for just this kind of work. Husky double-chevron cleats pull in forward or reverse, defy rock cuts and bruises. B.F.Goodrich FLEX-RITE NYLON cords withstand double the impact of ordinary cord materials, resist heat blowouts and flex breaks. Result: This B.F.Goodrich cord body outwears even the extra-thick tread, can be retreaded over and over.

Other B.F.Goodrich products at work at Glen Canyon include conveyor belting, air hose and fire hose. Special maintenance and service for tires and industrial products are also in operation—all part of the new B.F.Goodrich Unified Contractor Program. No matter what your off-the-road job, B.F.Goodrich

is ready to serve you—and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. The B.F. Goodrich Co., Akron 18, Ohio.

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment



B.F.Goodrich off-the-road tires

# WET JOBS

#### WELLPOINTS ELIMINATE SHEETING

Harbison-Walker Brick Refractory, Hammond, Ind. — Contractor: Consolidated Engineering & Construction Co.



WHEN A JOB-SITE is located, like this one, in the middle of a swamp—and when the water-bearing soil is a fine sand with an underlying layer of clay—it's not surprising that the contractor should figure on sheeting. Such expense, of course, runs heavy.

- Actually, in this case—as in many others which "look like" aheeting jobs—Griffin engineers were able to solve the problem far more quickly and economically with the use of wellpoints alone. Photo shows 2-stage system which successfully drained the 27 ft of ground water as required.
- Whatever your pre-drainage problems—power plants, pipelines, buildings, etc.—if you want lower costs for lowering water, it will pay you to check with Griffin, wellpoint specialists for over 2 decades.

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# Construction Methods AND EQUIPMENT

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JUNE, 1959

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#### ON THE COVER

Sam Pistario's Marriotsville, Md., quarry is supplying Frederick contractor T. Edgie Russell Co. with stabilized base material for their road job near Sykesville. A Barber-Greene 828 plant mixes-in 7 lb of calcium chloride per ton of stone and discharges the material with 5 to 6% moisture. Spread in three 4-in. lifts, the base is paved with a three-layer, 6½-in. blacktopping.

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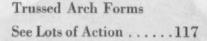
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## Pay Dirt in This Issue

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Raising and repairing two concrete pontoons for a floating bridge that sank mysteriously during the night is a difficult and costly job for a team of joint venture contractors.



Form sections, specialy designed for easy stripping and moving, get five reuses in construction of a railroad freight station with 30 identical arch bays in Los Angeles.

# Carving a Power Plant Out of Rock . . . . . . . . . 136

Six contractors are drilling, blasting, and hauling a total of 40,000,000 cu yd of rock at the Niagara Power Project. Each of the jobs has its own particular problems.







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NEXT MONTH—For the eleventh consecutive year, CM&E will publish its Equipment Maintenance Guide for contractors. It will include a series of comparative specification charts for many of the most important classes of construction machinery. In addition, manufacturers' service experts tell how to maintain the rigs for best production.

# Warner & Swasey Announces the ALL-NEW... Hopto Line

### **MODEL 500**

carrier or crawler mounted

This all new Model 500 HOPTO Hydraulic Excavator packs heavy duty capacity with a full 360° swing and a digging depth of 20 feet. Operation is fully hydraulic—there are no cables, drums, sheaves, chains or belts. A 100 gpm triple tandem pump and split control valves provide three individual hydraulic circuits. All three circuits can be operated simultaneously for full power and speed on all actions. Quick-change attachments include backhoe, shovel, clamshell, and ditch cleaning buckets. Buckets up to 3/4 yard.





### **MODEL 200-TM**

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This 3/8 yard Model 200 Hopto rolls from job to job at highway speeds, digs 13'6" deep, and outworks many 1/2 yard excavators. Operation and control are fully hydraulic with the Hopto triple hydraulic system for full power on simultaneous multiple actions. Backhoe and shovel buckets are interchangeable.



**MODEL 200-SPC** 

self-propelled crawler

Tough working conditions are madeto-order for this crawler mounted Model 200 SPC. Offers the same triple hydraulic system as the Duplex truck mounted model. Seat swivels to face either set of controls for fast operation. It digs 14' deep, has a 19' reach, 11' loading height.



**MODEL 200-SPR** 

self-propelled carrier

Fast job-to-job mobility, easy one man operation, and a 16 foot turning radius are built-in advantages of the Model 200 SPR. Triple hydraulic system and dual controls mean fast cycling and high production. Backhoe or shovel buckets are interchangeable in minutes.

Distributors in over 75 principal cities in the United States and Canada

#### FEATURES COMMON TO ALL HOPTO MODELS

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# Hopto\*

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## THE WORLD'S MIGHTIEST MOTOR GRADER

A Valuable
Tool for
Modern
Highway
Construction



GALION'S T-700 Grade-O-Matic Motor Grader is a powerful giant with versatile capabilities and tough "muscles" that do precision work or the roughest and heaviest work

GALIN PAUTO MITE

 The gigantic 14' x 30" x 1" hydraulic shiftable moldboard moves the biggest and heaviest windrow of any grader. Maximum reach outside rear tires is 109". with the ease of a trained athlete.

This champion of motor graders—with 220 horsepower balanced to 42,000 lbs. of weight—answers the need for new records for fast work cycles, deep cuts, most blade capacity, maximum push power at the blade, and incomparable handling ease.

The most notable advancement in motor grader operation is in the AUTOMATIC features designed into the Galion T-700—automatic multiplication of torque, automatic application of power, and automatic regulation of working speed.

There is no tiresome clutch operation because there is no foot clutch. A power-shift transmission does the hard work. Engine stalling and lugging are eliminated.

Ruggedness of construction is evidenced in the 6" square solid steel drawbar, the box-type frame which weighs 160 lbs. per foot, the circle weight of 54 lbs. per foot, and the size of the tapered front wheel spindles which are 3\(^3\)/4" and 2\(^1\)/2" diam-

eter at the bearings. Unequaled front end stability is provided by the 16.00 x 24, 12-ply tires.

The most recent advancements in engineering and design are employed to give the utmost in dependability and ruggedness—the last word in combination manual with power booster steering; efficiency in the circle reverse; thick, heavy, rugged gear case; and the most secure attachment of drive wheels to stub axles ever devised.

Work records all over the country have proved this super grader has unmatched work capacity—the kind that's needed on the mammoth Federal highway construction program. The usual enthusiastic comment of contractors who are using the T-700 is that it does more than twice as much work as any other grader they have ever used.

For further information write The Galion Iron Works & Mfg. Company, Galion, Ohio, or any of their distributors.





• The torque converter drive, power-shift transmission, tail-shaft governor, and decelerator utilize with utmost efficiency the 220 hp from the Cummins diesel engine. The tremendous weight and power of the Galion T-700 is especially effective on bank-cutting work.

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TOUGH!

# THIS RUGGED, POWERFUL 3 DRUM NORTHWEST CRANE

is handling 132" pipe—digging trench and setting up to 50 sections a day in a highly congested area under wires, around trees and with traffic moving.

Northwest mobility and Northwest advantages smooth out the job problems under all conditions.

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PULLSHOVELS 94 Yd. 10 21/2 Yd. TRUCK CRANES

# newathey

25-ton-capacity rear dump hauls

# EXTRA PAYLOAD!

Tough new T-1\* Steel and new T-line Design mean extra tons per haul...faster round trip time...greater operating economy!

PR619 marks the coming of Athey's new trailer line—the T-line. New T-line design combines time-proved principles of Athey Trailers—extreme maneuverability, big loading target, ground-hugging roadability, fast clean dump—with new features and remarkable new T-1 Steel. Result? A sturdier, faster, trimmer vehicle that replaces dead weight with 15% extra payload!

\* Registered Trade-mark, United States Steel Corporation.

amazing New T-1 STEEL. Around the world, engineers have hailed its exceptional toughness, its resistance to impact abuse and abrasion even at 50° below zero, its yield strength—nearly three times that of structural carbon steel. Pioneer in the use of T-1 Steel in hauling, Athey now puts T-1 Steel to work in the new rear dump PR619. T-1 Steel of 100,000 minimum yield strength equips PR619 for more punishment, longer life with less downtime, more payload, less "deadload" every trip!



T-LINE! PAYLOAD OVER 21/2 TIMES DEADLOAD—possible with tough new T-1 Steel. PR619 carries over 21/2 times its own weight—25 tons or 20 cu. yds. heoped on a 2:1 slope.

T-LINEI 225 HP, 30.2 MPH—power comes from the lusky new Caterpillar No. 619 Tractor, reserve power for high speeds on steep rugged hauls.



T-LINE! BIGGER LOADING TARGET—13'7" by 9'2½". PR619's new flared T-line body top increases target area without increasing trailer width—speeds loading.

T-LINE! SPILL DEFLECTORS — new T-line body design of PR619 retains load—protects tires and hydraulic system during loading.



Hau sque outp up t

Athe

T-LINEI SELF-ALIGNING HOISTS—Twostage hydraulic hoists of PR619 work free of bending stress...act fast, setting up straight line 57° dump angle over full trailer floor length for 12-second dump!

T-LINE! HYDRAULIC SYSTEM—features new gear type pump, full-flow filtering and four-bolt split flome fittings for top performance, long life.

# Line PR619 TRAILER



#### What Does Obsolete Equipment Cost You?

Hauling with yesterday's equipment puts a real squeeze on profits. Rising maintenance costs, low output per manhour and per gallon of fuel, mount up to a daily "cost of obsolescence." But this is one cost you can wipe out completely!

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PR 619

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# TEXACO PLAN makes mobile lube rig a complete service station

Harbert Construction Corporation, Birmingham, Alabama, cites fine performance record of Texaco lubricants

Although their work on the natural gas pipeline for Florida ranges over 1,000 miles of pipeline, Harbert Corporation's equipment is never out of reach of complete lubrication. The reason: mobile lubrication rigs. And with the Texaco Simplified Lube Plan, each rig is completely equipped to service any lube point on any machine, wherever it's working. There's no time lost deadheading equipment back to a fixed service center. As a result, all equipment gets proper lubrication at the right time.

Systematic lubrication is easier with the Texaco Plan, too. The Texaco Plan indicates

clearly what lubricant goes where, and how often, so equipment delivers peak performance. And simplified inventory saves man hours in storage and handling, cuts the chance of lubricant misapplication.

A Texaco Simplified Lubrication Plan can cut costs and boost performance on your next project. Just call the nearest of the more than 2,000 Texaco Distributing Plants, or write:

Texaco Inc., 135 East 42nd Street, New York 17, New York.



### COMPLETE SERVICE, ANYWHERE,

is possible with a mobile rig and a Texaco Simplified Lube Plan. A Texaco Plan cuts inventory so you can put every lubricant you need for every machine on a single truck.

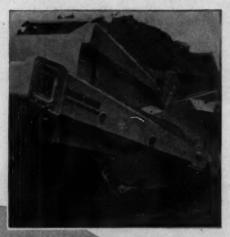


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CW-215 SELF-PROPELLED SCRAPER Capacities: 15 cu. yds. struck, 21 cu. yds. heaped, 42,000 pound rated load

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If it does, don't make a save till you've the sed out the self-propelled CW-215 scrapes, a 15 yd, struck-21 of, heaped unit ... You can really exceler the the production of the equipment fleet with this plus-yardage and turn opacity screen — which will dovetail right into your present work of the infout upsetting schedules . . . Like all Curries Wright crapers, you also get a practical combination of unit construction, Roto-Gear steer, constant live winch and positive roll-out ejection. Ask your local Curtiss-Wright distributor to show you a CW scraper in action — he's the man to know if you want to move more dirt at a greater profit to you.

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SOUTH BEND, INDIANA

## Construction News From Washington

Washington, D.C. June, 1959

### **Congress Tackles Highway Financing**

Continued progress of interstate highway construction is at stake in legislation before Congress. House committees have laid the groundwork for measures designed to maintain annual allocations of Federal interstate aid at the \$2.5-billion rate established a year ago. But without new legislation to finance the Federal commitments, there could be no interstate allocations this summer and only \$500 million next year.

State highway officials have testified that such a two-year lapse in allocations of Federal aid would cause a three-year delay in completing the Interstate Highway System. Economic loss to the highway industry and highway users would total at least \$10 billion, the American Road Builders' Association estimates.

Interim financing to take care of the next two allocations is all that Congress has to provide this year. In 1961 Congress will have the full research information it has asked for to write the tax legislation that will carry the program through to conclusion.

But finding the money to carry the program through the next two years is becoming more difficult daily. President Eisenhower still insists on raising the necessary funds through an increase in the federal tax on gasoline and diesel fuel. Congressional opposition to this tax boost is solid.

Most leaders in Congress would like to pay for a continued high level of interstate highway construction with money from the Treasury Department's General Fund. But the President almost certainly would veto this type of deficit financing of the highway construction program.

Administration officials are discussing all sorts of compromise measures with Congressional leaders. Right now only one thing is certain: neither Congress nor the Administration wants to slow down the interstate highway building program.

## **Breakthrough for New Starts**

A small relaxation of the President's no-new-starts dictum for public works projects showed up when the White House permitted the Army Engineers to shift some budgeted 1960 funds to the planning of 22 new civil works projects. Money for the advance engineering design of these jobs would come from savings made possible by a revised estimate of Corps of Engineer spending for next year.

Originally the Administration had banned both planning starts and construction starts on new projects. Now advocates of water development programs have strong hopes for a breakthrough on construction starts also. They expect Congress to add starting money for at least a dozen new projects to the Public Works Appropriation Bill.

continued on next page

### **Big Dams for the Northwest**

Bright prospects for construction of large dams in the Columbia River Basin are confirmed by an Army Engineer report that will be ready for Congress before the end of the year. The report recommends 13 major projects that will cost more than \$1.8 billion.

Concurrence by Canada is necessary to permit construction of the largest of these—the long-delayed, \$308-million Libby Dam. That project, and others on both sides of the border, will be firmed up if the two governments get together on cooperative development of the Columbia River system. Representatives of the U.S. and Canada on the International Joint Commission are making promising progress toward a mutually acceptable agreement that can be recommended to the governments in Washington and Ottawa.

### Federal Office Buildings

The House Appropriations Committee has approved \$25 million to buy sites and prepare plans for government buildings throughout the country. Congress wants no slowdown of the \$600-million building program that it took over a year ago after the lease-purchase experiment died. Congress appropriated \$40 million last year to get work started on the first \$200 million of project authorizations.

## Big Atom Plant on the Way

There are no obstacles in Congress to hold up an appropriation for the \$100 million lineal electron accelerator that the President approved last month. Two miles in length, the big accelerator will be built near the Stanford University campus in California.

Construction of additional facilities in other parts of the country may be expected to follow. The California project is merely the biggest and most urgent of several recommended to the President by a special scientific advisory panel. This group cited needs also for a powerful proton accelerator and for other high-energy units at locations accessible to universities.

Building all of them as recommended would call for Federal construction outlays of at least \$50 million a year over a period of several years.

#### **Jobs in Construction**

Construction workers are finding it easier than other workers to reclaim jobs lost during the recession.

A Labor Department report shows that construction is the only major industry in the U.S. in which employment already has bounced back to the high level of two years ago. More than 2,600,000 construction workers were on jobs in April, the latest month for which the Labor Department has complete figures.

## 200 cubic yard-per-hour output of NOBLE job-site batching plant key to largest concrete construction contract

By providing up to 1000 cubic yards per day of quality concrete unobtainable from local sources, a NOBLE job-site batching plant was instrumental in securing the largest concrete job ever let in the Phoenix, Arizona, area - 60,000 cubic yards—for Job Concrete Construction Company, Pomona, California. With the NOBLE plant batching and discharging 4 cubic yards of cement and aggregates in 72 second cycles at the job site, only 10 transit-mix trucks, each hauling an average of 80 cubic yards per day, are required to upply all concrete for 2,000,000 square feet of slabs, gutters, sidewalks and foundations on the \* Luke Air Force Base housing project of 725 homes and for lining a 21/2 mile long flood control ditch. With recorder and other automatic controls to meet rigid Corps of Engineers specifications, the plant has a 4-compartment 150 ton capacity overhead aggregate bin and a separate 500 barrel capacity overhead cement silo. A second overhead cement silo can be added using the existing 350 barrel-per-hour vertical cement elevating screw.



All NOBLE batching plants with overhead aggregate storage capacities ranging from 100 to 500 tons or more feature big savings from fastest erection. NOBLE requires no outside purchase of essential components or extensive field assembly and wiring. These normally out-of-pocket expenses with conventional plants are included in the price of NOBLE and may become a part of long-term equipment financing. Available cash is thereby released for current expenditures.

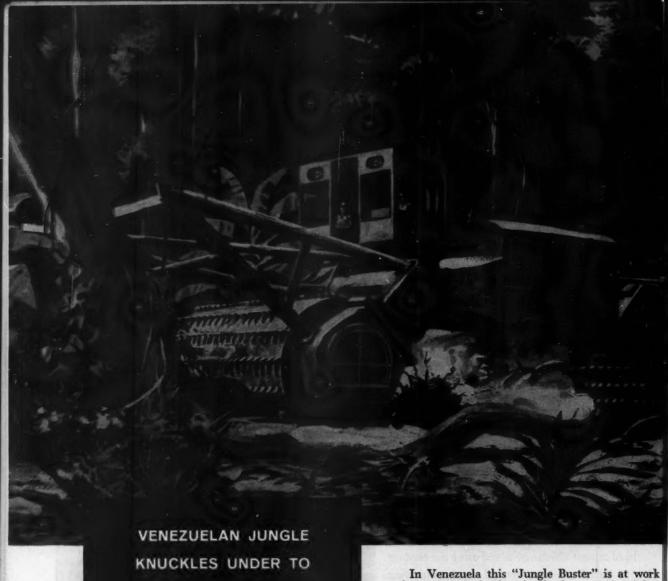
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In Venezuela this "Jungle Buster" is at work clearing virgin land so fertile that corn is 15 feet high 6 weeks after the Crusher makes its first pass!

This amazing 150-Ton Tree Crusher is powered by the Electric Drive System developed by R. G. Le Tourneau, Inc.

Instead of wheels, powerful electric gearmotors drive two huge, cleated cylinders to crush the



"JUNGLE BUSTERS"

BY R. G. LeTOURNEAU, INC.

LOG LOADER is all-electric. All movements are powered at points of work by electric motors, eliminating transmissions. Fingertip controls allow sensitive, fast log handling without friction clutches.



PULPWOOD TRANSPORTER picks up, carries, places 35-ton pallets. Electric braking controls machine at exact speed selected... has no friction surfaces to wear out. Electric Stacker handles, unloads pallets.



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SNO-TRAIN built for Army crosses deep Arctic snow carrying 50-ton loads. Tre-mendous traction of individually-powered Electric Wheels and flotation of 10-foot high, low-pressure tires keep it going.



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R. G.

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Tre

# In Last Five Years Electric Drive Conquers Mountains, Deserts and Jungle On Every Continent



For over five years, Electric Drive machines built by R. G. LeTourneau, Inc. have been conquering wilderness areas of the world...doing BIG jobs at lower cost and in less time than conventional equipment.

Basic element in their success is the Electric Wheel... major component of the System of Electric Power and Control built by R. G. LeTourneau, Inc. When applied to the Tree Crusher, the same high-torque DC motors with gear reductions are mounted inside the drums. This principle has been uniquely successful in the 150-ton and 70-ton Tree Crushers and is now available to the construction industry in a self-powered Sheepsfoot Compactor. This is a 50-ton machine built to comply with federal dam specifications.

Components of the Power and Control System all were developed — and are manufactured exclusively — by R. G. LeTourneau, Inc. Their dependability — as demonstrated by hundreds of successful applications — has created a new class of heavy duty mobile equipment.

#### NOW IN EARTHMOVING

Earthmoving machines with electric drive—one of them shown below—have recently been built for the BIG jobs in construction and mining. For information please call or write 2395 South MacArthur, Longview, Texas.

fallen trees pushed over in its path. Matted debris left after the Crusher passes is easily piled or burned.

The Tree Crusher — and other machines in the Jungle Buster team developed by R. G. LeTourneau, Inc. — is at work right now opening up frontiers for agriculture and industry at one-third the cost of conventional clearing operations.



## R.G. ETOURNEAU INC

LONGVIEW, TEXAS



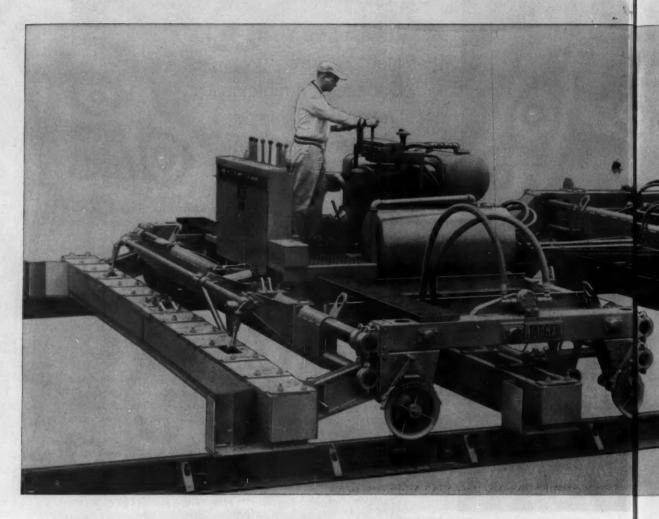
STACKER picks up 25 tons of logs in one bite or handles single log with jointed, powered tusks. All movements powered at work points by electric motors and controlled by simple fingertip switches.



GEARS are cut in our own plants for Electric Drive equipment. We make all our own standardized components, including all electric motors, generators and other parts for our System of Electric Power and Control.



ELECTRIC SHEEPSFOOT ROLLER 50-ton electric-drive compactor built to federal dam specifications. Six-foot drums reduce rolling resistance, give feet more thrust. Get details on this M-50, and other machines.



# JAEGER FINISHER-FLOAT gives the final machine finish without added labor

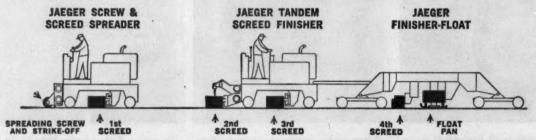
(Towed and operated from any finishing machine)

This is the machine you've always wanted to complete the job behind your finisher.

Gives 4-to-1 Correction: It has a narrow-bottom, short-stroke screed and a wide float pan. Both are suspended between bogie axles giving a 4-to-1 ratio of

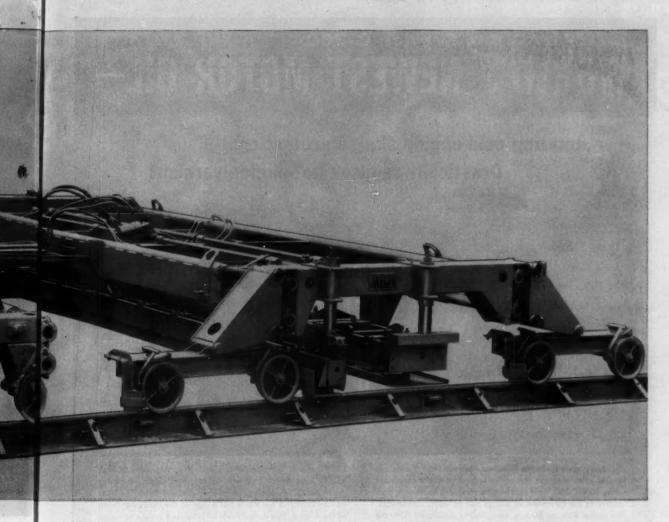
correction (a 1/8" irregularity in the forms is reduced to 1/32" in the pavement).

Independent of Forms: The screed has hinged, spring-loaded end shoes so that it and the float are both independent of adjacent form level. The smoothness



TODAY'S PAVING TEAM (Spreading Screw, Strike-Off, 4 Screeds and a Float) NEEDS ONLY 2 OPERATORS.

Page 18—CONSTRUCTION METHODS and Equipment—June 1959



specified on Interstate and State highways and U. S. Engineers airport work is easily achieved. The floated surface is usually ready for burlap and cure.

"Kiss Finish" of the 6" bottom, 4" stroke screed eliminates high and low spots ahead of the float without bringing up grout or disturbing large aggregate at the surface. Three screed speeds are available at the touch of a lever.

Quick crown change screed, raised or flattened by turning one ratchet lever, is standard. You have your choice of parabolic or gable crown type.

No Separate Operator Needed: The machine is towed by any finishing machine, and controlled by the finishing machine operator. Screed drive, and screed and float lift, are hydraulically powered by an air-cooled engine and hydraulic system which are mounted on the deck of the finisher. Quick disconnecting, self-sealing hydraulic couplings, and single tow-pin, permit detaching machine in 2 minutes for moving or operating the finisher independently — a big advantage.

20' to 26' Quick Width Adjustability is provided by telescopic frame and screed and float extensions.

For Full Information see your Jaeger distributor or ask us for Catalog FF-9 giving detailed specifications on this modern cost-saving paving tool.



THE FINAL KISS TO A PERFECT PAVEMENT: 30" wide float pan, immediately behind suspended oscillating screed, completes the smoothest finish obtainable by precision paving methods. All corrections are first made by the screed. The kiss of the float pan, to the accurately metered surface, gives the perfect finishing touch to the slab.

#### THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

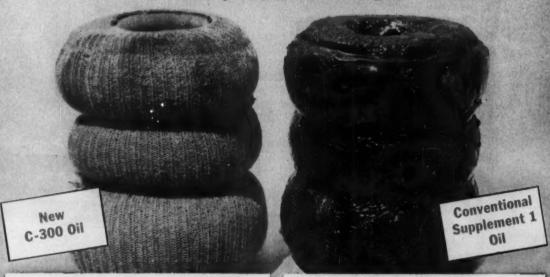
Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario
ALL-HYDRAULIC FINISHERS • CONCRETE SCREW & SCREED SPREADERS
AGGREGATE SPREADERS • COMPRESSORS • PUMPS • MIXERS • TRUCK MIXERS

June 1959-CONSTRUCTION METHODS and Equipment-Page 19

# WORLD'S NEWEST MOTOR OIL

Amazing cold-engine sludge protection...

Drastically reduces hot-engine varnish!



This heavy-duty sock type filter was removed from a gasolene engine after a severe test under low temperature conditions using new C-300. This cold-engine service is extremely conducive to the formation of sludge due to water condensate. But notice that the filter is only slightly discolored from the oil . . . filter is still in perfect operating condition. New C-300 more than doubles filter life!

This filter was removed after identical service using a high quality Supplement 1 oil with conventional additives. Heavy "shoe polish" sludge has completely clogged filter. The filter can be replaced but this is just a sign of the inside condition of the engine. This sludge clogs oil rings and causes compression ring sticking that results in excessive oil consumption and increased engine wear and operating costs.

#### **IDEAL FOR BOTH GASOLENE AND DIESEL ENGINES!**

Modern motor oils came of age during the war years when detergent additives were introduced to permit the operation of highoutput diesel engines. However, these engines operated at sustained high speeds and high temperatures while construction work often calls for intermittent, if not substantial, cold-engine operation.

Cities Service now introduces the new C-Series oils that not only give superior hot-engine protection, but for the first time, prevent the sludge that clogs valve lifters and filters, causes sticky rings and wastes gas and oil during cold-engine operation.

Ideal for diesel and gasolene engines, new C-300 has an extremely high detergency level . . . highly inhibited against oxidation . . . prevents sludge and varnish . . . contains a special anti-wear additive . . stops rust and corrosion . . . in short, it's the most remarkable development in fleet motor oils in the last decade. Have a Cities Service Lubrication Engineer call with the full details on new C-Series oils; or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



The key to this remarkable performance is "dispersancy." Above you see a photomicrograph of a conventional Supplement 1 oil after 1800 miles of use. Compare this with the enlargement of used C-300 below. These particles are less than one-tenth the size. Finely divided dispersed material remains in the oil while bigger particles settle out.

CITIES ( SERVICE

New C-300

## Job Talk ...



## **Crane Boom Positions Drills**

A job-built frame bolted to a crane boom carries a pair of drills to hard-to-reach holes at the top of cuts on a road-widening job in New York.

In some places it was impossible to bring drilling equipment to the top of steep slopes alongside the road. So John Arborio, Inc., mounted the drill-carrying frame on the boom of a Lorain truck crane and hoisted the drill rigs into position from the road. The rig also proves useful working in tight places between trees and under wires.

The welded frame that holds

the drills consists of two 4-in. beams connected with braces and bolted to the under side of the crane boom. It extends 25 ft from the bottom section of the boom to within 2 ft of the boom tip.

A saddle that slides up and down the boom (the beams serve as rails) holds a cradle that carries the drill columns and jacks on each side of the boom. The cradle is held in place by the hoist cable attached to an eye on the saddle.

When in operation the boom is lowered so that the jacks at each end support the load of the drills.



#### **Catwalk Erection**

A forklift erects a 12-ft section of catwalk in the tailrace tunnel of the Haas hydroelectric plant on the Kings River in Calif. The catwalk will provide emergency access through the tunnel to an underground powerhouse.

The steel catwalk is 2,000 ft long. It consists of two 6-in. channels connected by 1½-in. angles running diagonally between the bottom flanges. A flat bar grid laid between the channels forms the floor of the catwalk.

Kelly Bros. of San Jose, Calif., subcontractors on the job, hang the catwalk from the solid granite roof of the tunnel with %-in. cables suspended from special eye bolts. Manufactured by Bethlehem Pacific Coast Steel Co., the eye bolts are %-in. dia., 24 in. long. They thread into a C-type expansion shell.

The contractor drilled pairs of continued on page 28

# LABYRINTH WATERSTOPS

A SOUND INVESTMENT FOR CONCRETE CONSTRUCTION I



LABYRINTH AVAILABLE IN 2, 3 or 4 rib

#### ON YOUR CONSTRUCTION:

- 1. Consider the investment in design, materials and labor (to mention a few).
- 2. Then consider how important safe, secure watertight concrete joints are.
- 3. Thorough watertightness can be secured by installing Labyrinth Waterstops—a dividend that makes the low initial cost of the product insignificant when compared to your total investment—and one that insures watertight concrete joints for years!
  - Corrugated ribs grip concrete, insure an everlasting bond between joints.
  - Finest polyvinyl plastic resists chemical action, aging, severe weather.
  - Takes just seconds to nail to form ... easy to cut and splice on location (prefabricated fittings available).
  - There's a Water Seal product for every type of concrete work!

If your aim is to stop water seepage, stop it effectively with Water Seals' Water-stops!

#### "See Us in SWEET'S"

New Literature and Free Samples Sent on Request-Use Coupon Below

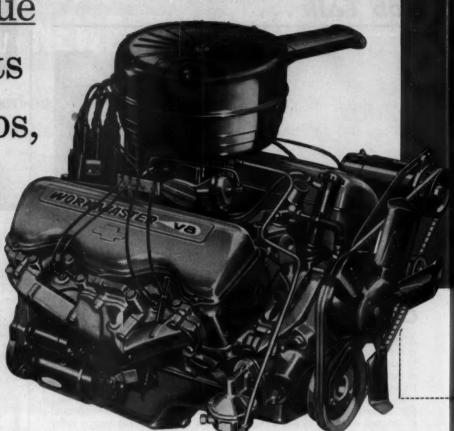
## WATER SEALS, inc.

9 SOUTH CLINTON STREET, CHICAGO 6, ILL.

Made in Canada for J. E. Goodman Sales, Ltd.
Toronto, Ontario

WATER SEAL 9 S. Clinton Chicago 6, II Please send i literature.	Street lineis	DEPT. 2
Name.		
Company		
Address		
City	Zone_	State

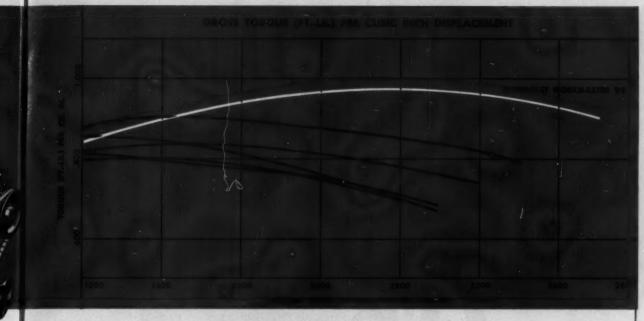
It's torque that beats tough jobs, and this engine has it to spare!



# CHEVROLETS 348-CUBIC

It's torque you need in a big-truck engine. Torque that gives the truck plow-horse pulling ability at low speeds ... torque that assures the power to keep big loads moving, whether it's through the rough or over the road. And Chevrolet's 230-h.p. Workmaster V8, with efficient Wedge-Head design, short piston stroke and the right kind of valve timing, puts out a brand of torque that's made to order for your toughest big-tonnage hauls.

No job's too tough for a



Here's proof that Chevrolet's 348-cubic-inch Workmaster V8 puts out plonty of torque—all the pull and power you'll ever need for your high-tonnage hauls. The white curve above shows that the Workmaster provides high torque throughout the entire range of operating speeds; that it puts out high torque at low r.p.m.'s where you need it for tough off-road situations, maintaining high torque right up to governed speed. The black curves on the above graph represent the torque output of typical heavy-duty 6-cylinder engines of between 330 and 390 cubic inches of displacement. (Each of the above curves demonstrates actual torque output efficiency, on a basis of gross foot-pounds of torque per cubic inch of displacement.)

# -INCH WORKMASTER V8

Among today's big-truck V8's, Chevrolet's 348-cubic-inch Workmaster is outstanding for its ability to produce extra foot-pounds of work-whipping torque. This high torque output is the natural result of the Workmaster's unique design characteristics. Short piston stroke and large piston area, for example, comprise a torque-producing advantage, and this engine provides the shortest stroke in its class.

Advanced Wedge-Head design, with its fully machined combustion chambers, means high torque, too. It assures high turbulence of the fuel-air mixture and balanced power output from each cylinder. The Workmaster V8 has high volumetric efficiency . . . takes in the fuel-air mixture efficiently at all speeds. This, combined with a camshaft design that gives just the right valve lift and timing, assures high torque – extra pulling power to get you through the tough spots!

And this engine is designed for durability as well. Tough Moraine-400 bearings, for instance, last up to 7 times longer than ordinary bearings. Stellite-faced, high alloy exhaust valves resist wear. Tough induction-hardened crankshaft journals last longer . . . Rotocoil exhaust valve rotators increase valve life by as much as 300%.

For these reasons and many more like them, the Workmaster is a solid performer — a sure answer to extra savings on big-tonnage runs. Now standard equipment in all Chevrolet Series 90 and 100 trucks, it powers G.V.W.'s up to 25,000 lbs. and G.C.W.'s up to 48,000 lbs. . . . or, in Series 100 tandem models, G.V.W.'s up to 36,000 lbs., G.C.W.'s up to 50,000 lbs. For the kind of torque and toughness you need to do big jobs better, see your Chevrolet dealer about a Workmaster V8! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Chevrolet Truck!



what makes the big new 771 B a great crane?

71:B

# Performance makes it great!

This crane has more of the features you want to keep jobs ahead of schedule — more of the features that make erection jobs really profitable! Take a look — the 71-B, with its new tubular boom and jib, will reach a long 250 feet up! It combines this kind of reach with brute strength to give you an ideal lift combination.

NEW BOOM HOIST SMOOTH AS SILK... even with the biggest loads! It's fully independent of other operations, has power-controlled lowering and hoisting. The lowering disc-type clutch is a new feature—it's smoother when engaging and releasing.

#### **FULL AIR CONTROLS OPERATE EASILY ON THE 71-B!**

The operator engages clutches, swingers, boom hoist—all with finger-tip ease. To keep the "feel" so necessary to good operation, graduated valves are used on main operating clutches.

THE 71-B's A GROUND HUGGER! Stability makes a key difference on BIG lifting jobs because a steady machine turns out measurably greater production. Weight of the 71-B is spread out over these long crawlers to make the rig rock solid!

THESE ARE JUST A FEW OF THE REASONS why the 71-B is an outstanding big crane. Get the facts from your Bucyrus-Erie salesman . . . have him demonstrate the 71-B and see the features that will make your lifting jobs more profitable.

For more information, write Dept. 11EA, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

## THIS NEW BOOM IS LIGHTER — STRONGER

The new tubular boom (available on 71-B) is lighter. You can use boom and jib combinations up to 250 feet. Bigger cross section makes the boom more stable.



**Builds Better Equipment** 

**BUCYRUS-ERIE COMPANY** 

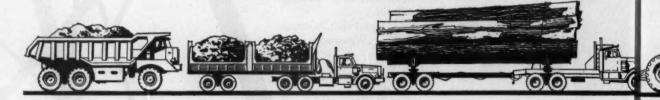
South Milwaykee, Wisconsin

NEW,
RUGGED...
HI CAPACITY...

5-G-1220 Heavy-Duty, 5-Speed TRANSMISSION

LONGER LIFE with pressure filtration and lubrication EASIER SHIFTING with countershaft brake

... for TOUGH





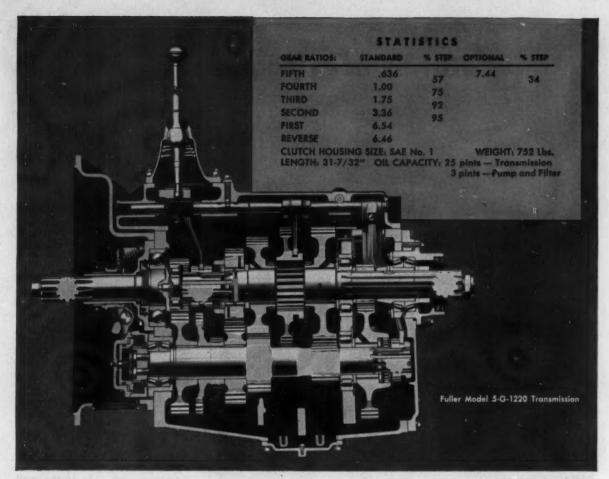
The Fuller model 5-G-1220 Transmission is engineered for heavy-duty operation in big earthmoving, logging, mining and quarrying equipment, including prime movers pulling scrapers of 12 to 14 cubic yards capacity. This new model is also designed for off-highway service in

trucks equipped with engines of equivalent torque and horsepower.

Model 5-G-1220 offers higher capacity than other models in the '1220 series previously produced through elimination of axial thrust factors by the use of spur type gearing throughout the unit. As standard equipment

Unit Drep Forge Div., Milwaukee 1, Wis. \* Shuler Axle Co., Louisville, Ky. (Subsidiary) \* Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

Automotive Products Company, Ltd., Brack House, Langham Street, Landon W.1, England, European Representative



# off-highway service!



on the 5-G-1220, the following innovations are featured:

- Pressure lubrication and filtration system;
- 2. Countershaft inertia brake.

The pressure lubrication and filtration systems provide positive lubrication of the mainshaft pilot bearing and mainshaft gear bushings, keep the gear oil clean between changes, and prolong gear and bearing life. The air powered countershaft brake, which is activated simply by pushing a button, permits quick upshifts without double clutching. Both high production and reduced operating costs for off-highway jobs can be secured by using the 5-G-1220 Transmission. Ask your equipment dealer for further information about this unit, or write directly to the Fuller Manufacturing Company, Kalamazoo, Michigan.

**FULLER** 

MANUFACTURING COMPANY

KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

June 1959-CONSTRUCTION METHODS and Equipment-Page 27

# ROAD BUILDING with Symons Forms



Gong Forming . . . Symons wide panel forms made up in section of 10' x 24' and 15' x 24' used to pour 2,400 foot long retaining wall.



Bridge Forming . . . By using Symons high strength forms, contractor was able to reduce pouring time, use fewer men and cut 100 days off bridge forming job.



Cuivert Forming . . . A new  $9 \times 9$  inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts.

Symons can help you with your forming problems. Our engineers will prepare complete form layouts and bill of materials at no obligation. Other Symons products used in road building are bar ties, tie chairs, column clamps and shores. Forms, shores and column clamps may be rented with purchase option—rentals to apply on purchase price. Information on Symons products and services sent FREE on request.



**4255 Diversey Avenue** 

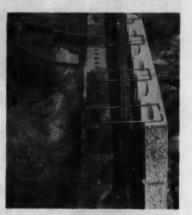
Dept. F-9

Chicago 39, Illinois

MORE SAVINGS FROM SYMONS

JOB TALK ... continued from page 21

30-in.-deep holes on 12-ft centers with an air leg jack hammer to hold the eye bolts. They shot levels for each of the anchor bolts, precut the cable hangers to exact required length, and taped and numbered the hangars for quick identification.



#### **Bricks Become Wall Forms**

Tests conducted by the Clay Brick and Tile Association prove the feasibility of building composite brick and concrete walls without forms for the concrete. The brick facing on each side of the wall holds the concrete core.

Person & Wick, Burlingame, Calif., built the experimental wall sections in two steps. First they built a single layer of brick for each face of the wall up to a height of 12 ft. High-strength steel wires tied the brick sides together. Then in a single pour they filled the core with concrete to complete the composite wall.

Concrete was very wet when poured—slump was as high as 11 in. Being porous, the brick absorbed most of the excess water in the mix. The moisture in the bricks helped to cure the concrete. Tests showed compressive strength of the concrete to be 4,000 psi.

Besides eliminating the cost of building, erecting, and stripping forms, the method offers considerable savings in labor because construction is broken down into two separate steps, each completed in a continuous operation. There is no delay waiting for the concrete to set and cure before applying a brick facing, as in conventional brick and concrete wall construction.



# HENDRICKSON

CARRIER

MENDRICKSON supplies custom carriers for:

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- AMERICAN HOIST AND DERRICK
- . BAY CITY
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Quality crane carriers . . . tailored to your particular needs. Not just assembled . . . precision crafted with top-quality components. A full line of carriers for cranes and shovels from 12½ to 60 tons . . . in four, six and eight-wheel models . . . gasoline, diesel, propane or self-propelled. For unmatched performance, durability and low-cost operation specify Hendrickson Custom Carriers.

HENDRICKSON MFG. COMPANY

2001 West 47th Street . Lyons (Chicago Suburb), Illinois



Equipped with famous Hendrickson Tandem Suspension, the standard of truck, trailer and equipment manufacturers

# They said it couldn't be done!

FIVE YEARS AGO Euclid started an intensified program of product improvement and development that was far beyond anything that had ever been done in the construction equipment industry. Always a leader in years-ahead engineering that made "Eucs" outstanding performers on the toughest jobs, Euclid anticipated your need for still larger, more efficient equipment to help beat the squeeze on profits.

Without tricky project names or slogans, the development program moved full speed ahead. New machines were put through exhaustive tests at Milford Proving Grounds and the General Motors Tech Center with its unsurpassed testing and research facilities. Then followed actual job operations on a wide range of work... under close check by Euclid product engineers so that further improvements in productive capacity and service life could be made. One by one, new machines were added to the Euclid line as their efficiency, design and reliability were established.

# 1954

# 5 YEAR DEVELOPMENT

... most extensive ever undertaken

Now Euclid offers the most complete line of modern, large capacity job-proved earthmovers in the industry. Here's what has been accomplished in the past five years to provide equipment that enables you to bid more profitably:

profitably:

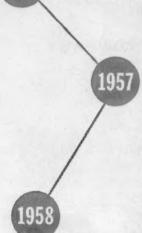
5 new scraper models with capacities from 7 to 24 yds.

struck...other models increased in power and capacity

4 new rear-dump haulers—12 to 35 ton capacities—with major improvements in performance of other models

2 new crawlers with a completely new design concept that provides unmatched work-ability . . . TC-12 with Twin-Power is the world's most powerful crawler

No matter how small or how big the job, there's a Euclid model that will move yardage more profitably. Before you replace or add to your equipment fleet, get all the facts from your Euclid dealer. He can show you how Euclid's development program can mean lower earthmoving costs and a better return on your investment. EUCLID Division of General Motors, Cleveland 17, Ohio



1956



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE





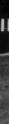
**\$-12** 17 yds. heaped

# PROGRAM

EUCLID



S-18 30 yds. heaped



TS-24 32 yds. heaped



C-6 202 net h.p.



SS-24 32 yds. heaped



R-27 27 tons



S-12 RD 22 tons

2 other models of 12 and 35 ton capacities

11 completely new JOB-PROVED earthmovers



OUTSTANDING PERFORMANCE, widespread use, and record tonnage production of BatchOmatic plants, of all sizes, have proved their revolutionary principles and features, first introduced in 1955:

First inherently automatic design ... simultaneous measuring of all aggregate gradations ... new principle of asphalt measuring ... pre-set proportions ... larger screening area, including full deck for fine material, and new adjustable directional throw ... exclusive material flow selector ... new Dyna-Mix pugmill for faster mixing, faster discharge ... fast-stacking, self-contained sections with quick-disconnect couplings ... and many others.

Now Barber-Greene announces the new BatchOmatic series, incorporating more outstanding advances—improvements based on the experience of all BatchOmatic plants operating on every type of job, producing every type of mix, including the abnormally rigid specs of the AASHO Test Road. These new features and improvements further increase ease and flexibility of operation, and daily tonnage output.

No lost seconds in automatic cycling—Only dry and wet mix cycles are controlled by timers. New sequence-relay system automatically starts each function the *instant* the previous one ends, substantially increasing tonnage.

New electric-over-hydraulic main controls—Controls electrically actuate hydraulic valves located directly on the rams, greatly reducing hydraulic piping, fittings and valves. Simpler construction and maintenance.

25% more weigh-hopper capacity—The unique multiple BatchOmatic weigh-hopper, which permits simultaneous measuring of all gradations, has been enlarged. Adjustable sidewalls are hydraulically controlled separately or simultaneously. Unlimited flexibility for handling all extremities of gradation percentages.

Multiple pre-set mixes—Easily switch to any pre-set mix. Pre-setting is instantly cancelled hydraulically for special mix. Automatic return to pre-set to resume production.

New, faster change of asphalt content—The unique, adjustable suction pipe measuring principle can now be quickly dial-set to the required number of pounds.

New fines control with fast change of proportion— Immediate dial-setting of fines content for any percentage of bulk or bagged mineral filler through new special vane feeder.

Also available with single weigh-hopper and power controls—These power-control towers have most of the BatchOmatic features, including interlocked dry and wet mix timers, and the asphalt measuring system. Available as 2-3-4-5- and 6000-pound plants.

New, improved auxiliary units: New, improved Barber-Greene Dryers, Portable and Stationary Dust Collectors, Aggregate Feed Systems, and completely new Wet Scrubbers further increase production of all asphalt plants.

These are just the high spots. Ask for literature on these new advancements.

59-13-A



CONVEYORS... LOADERS... DITCHERS... ASPHALT PAVING EQUIPMENT



# For extra high strength wire rope... use CF&I-Wickwire Double Gray

The CF&I Image reflects CF&I's experience as a producer of many steel products and CF&I's versatility in developing new products to meet exacting requirements...like Wickwire Double Gray\*.

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The special steel used in Double Gray provides extra resistance to the deforming effects of peening and crushing which occur on the drums and sheaves of heavy equipment. Double Gray also gives extra resistance to abrasion.

Because of these superior qualities, Double Gray rope quickly repays its slightly higher initial cost in safer, more economical operations. Use it wherever extra high strength wire rope is required.

For a free copy of our Double Gray booklet, write to: Advertising Department, The Colorado Fuel and Iron Corporation, 575 Madison Avenue, New York 22, N. Y.

\*Wickwire Double Gray Wire Rope is made of extra-improved plow steel. Fortified by an independent wire rope core of the same extra high strength steel, Double Gray rope has a 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.

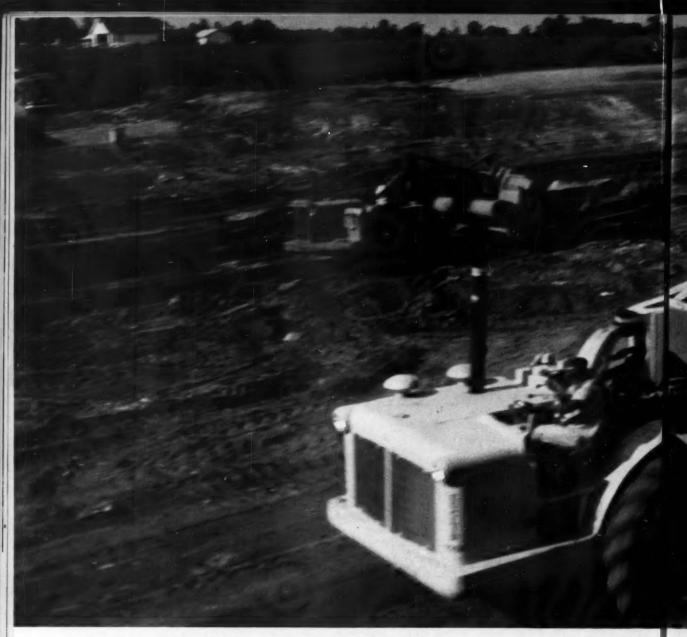
## WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION — Albuquerque · Amarillo · Billings · Boise · Butte
Denver·El Paso·Farmington (N.M.) · Fort Warth · Houston · Kansas City · Lincoln · Los Angeles · Oakland · Odessa (Tex.)
Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · San Leandro · Seattle · Spokane · Tulsa · Wichita

In the East: WICKWIRE SPENCER STEEL DIVISION—Boston · Buffalo · Chattanooga · Chicago · Detroit · Emlenton (Pa.)
New Orleans · New York · Philadelphia





Moves 1,050,000 yards of earth, sand rock and granite on

# GULF MAKES THINGS

In May 1958, the Ballenger Paving Company of Greenville, South Carolina, was given 270 days to clear, grade and drain 6 miles of Interstate 85, a South Carolina section of the Federal Highway system.

Ballenger not only had to dig through a million cubic yards of dirt and sand rock, they had to blast their way through large outcrops of stubborn granite. A really tough job, with power and speed at a premium.

They finished on schedule, and with plenty of proof that Gulf makes things run better. All earth moving equipment was powered with Gulf Dieselect—an automotive-type diesel fuel specifically refined for highspeed, high-powered diesel service. "On a tight schedule like ours," reports Ryan Graham, Ballenger Paving Superintendent, "a major consideration in choosing Gulf Dieselect was the better performance it provides.

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Gulf

with

"In our fleet of Eucs, Cats, crawlers and graders we use about 1500 gallons of Gulf Dieselect a day. We find it to be uniformly clean-burning, and our maintenance records show that it gives us no problems in the way of engine deposits or the fouling of fuel injectors."

Clean-burning Gulf Dieselect is one of many high quality petroleum products that help keep contractors' equipment delivering an extra margin of performance, with lower maintenance costs.



tough schedule-proves again

# RUN BETTER!

See how Gulf makes things run better on your next project. Contact your nearest Gulf office. Or write

for revised edition of 88-page "Contractors' Guide" (the maintenance "bible" for heavy equipment), and for the booklet, "Gulf and Your Business."



#### **GULF OIL CORPORATION**

on

Ryan

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Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Gulf man on the job checks fuel and lubrication requirements with Ryan Graham, Ballenger Paving Superintendent. On the left, Ernest L. Trowell, Gulf Sales Representative.



SP-9525

# Scaffolding Methods...

for curtain
wall construction
by Patent
Scaffolding Co.



EXACT LEVELS PROVIDED—"Gold Medal" Junior Safety Swinging Scaffolds are indispensable for installation of all types of facing materials in curtain wall construction. Here, they are being used during application of stainless steel spandrel units on Columbus & Southern Ohio Electric Co. office building.



FOR SETTING MULLIONS—Corning Glass Co.'s new 27-story building in New York requires 100 Junior Safety Swinging Scaffolds. Brown Window Mfg. Corp., Dallas, uses some for setting mullions while Pittsburgh Plate Glass Co. uses others for glazing. George A. Fuller Co., general contractor.



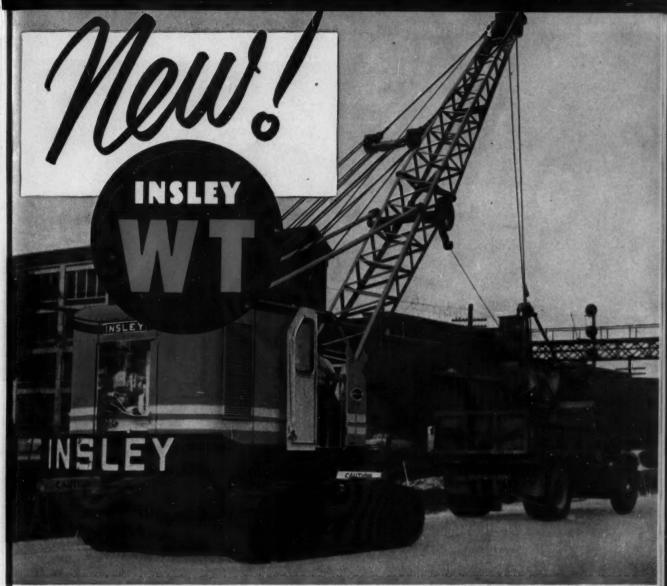
BUILDING A CURTAIN WALL—on Time-Life's new 48-story skyscraper in mid-Manhattan, 70"Gold Medal" Junior Swinging Scaffolds speed the work of installing facing. George A. Fuller Co. and John Lowry, Inc., joint venturers. F. H. Sparks Co., Inc.,

New York, uses these dependable scaffolds for setting mulions. They also were used by Shatz Painting Co., Inc., David Shuldiner, Inc., and General Bronze Corp. for other operations in connection with completion of this ultra-modern building.





38-21 12th Street, Dept. CM&E, Long Island City 1, N. Y.
1550 Dayton Street, Chicago 22, Illinois • West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.
In Canada: 355 Dufferin St., Toronto • Branches in all Principal Cities



Owner: J. J. Struzziery Co., Dedham, Mass.

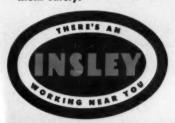
#### 1 cu. yd. excavator • 30-ton truck crane 25-ton crawler crane • 30-ton Maxi crane

Besides being as rugged as they come for unmatched "day in and day out" dependability, the new Insley WT is "power matched" to capacity for a profitable combination of performance, efficiency and long life. Here, for example, are a few of the many "plus values" that make the new Insley a top performer.

- Dependable, easily operated mechanical clutches.
- Precision boom raising and lowering through planetary gears.
- Power load lowering . . . full load control with maximum safety.

- Accessible lubrication and adjustment points encourage good maintenance for peak operating efficiency and long life.
- Designed with the operator in mind . . . wide vision cab with operator safety and comfort features.
- Unmatched parts and service program . . . 97 per cent of all parts orders shipped the same day received . . . parts available on a 24-hour basis.

See your Insley dealer now. Get all the facts on the new, top-performing Insley WT. See for yourself how it can bring in new, big profits in your type of work.



#### INSLEY MANUFACTURING CORPORATION

GENERAL OFFICES—INDIANAPOLIS 6, IND.
WEST COAST DIVISION—LOS ANGELES 54, CALIF.

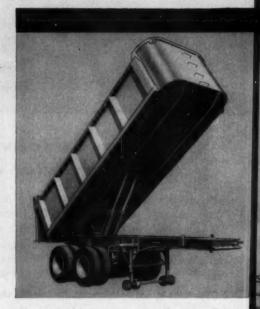
#### Choose from

#### Trailmobile's 4 basic dump trailers

and enjoy an unlimited range of options to meet your particular requirements.

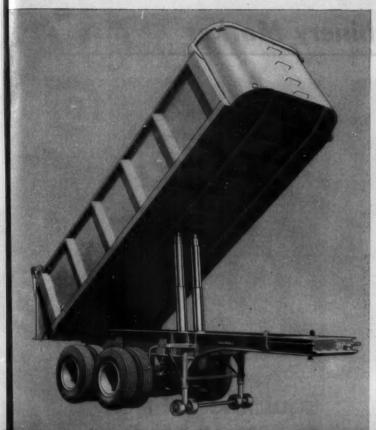
No single type of dump trailer can possibly meet the diverse requirements of construction work today. And that's why Trailmobile offers four basic dump trailers, all available in aluminum or steel, plus an unlimited variety of optional custom features.

Only by picking and choosing from a wide selection of body sizes, hoist arrangements and chassis construction can you obtain a dump trailer that exactly meets your specific requirements without undesirable compromises. And, only Trailmobile offers you so many "custom-design" opportunities. For more information, mail coupon now.



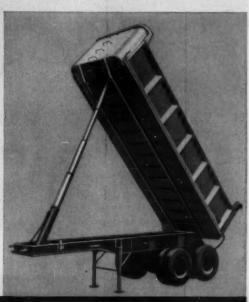
Twin Piston Underbody

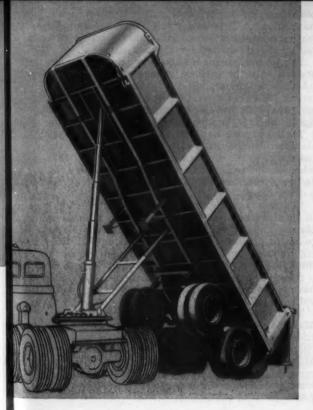
Frameless Telescopic



Twin Telescopic Underbody

Front Mount Telescopic (Single or Twin)





opic

#### TRAILMOBILE INC

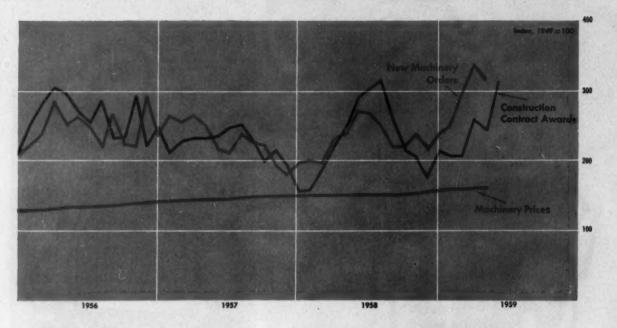
Cincinnati 9, Ohio . Springfield, Mo. . Longview, Texas . Berkeley 10, Calif.

Trailmobile Inc. • 31st and Robertson • Cincinnati 9, Ohio Please send me the new 8-page booklet on Trailmobile Dump Trailers.

name		
company		
address		
city	ctate	

TR-819

### Trends in the Machinery Market



#### **Price Index**

	APR. 1959	MONTH	YEAR AGO	% CHANGE 1958-1956
All Types of Equipment	171.8	171.7*	165.4	+ 3.9
Cranes; Braglines, Shovels Shovel, 1/2 cu yd Shovel, 3/4 cu yd	169.2 157.8 172.5	168.7 156.2 173.3	163.2 153.7 167.4	+ 3.7 + 2.7 + 3.0
Shovel, 1-1½ cu yd	162.1 167.8	184.6 159.5 167.8	175.8 153.9 162.7	+ 5.0 + 5.3 + 3.1
Crane, truck mounted	169.6 135.1	188.2 169.4 135.1	179.5 164.2 135.1	+ 4.8 + 3.3 0
Bucket, clam shell		157.5 169.3	152.7 180.8	+ 3.1
Scrapers and Graders Scraper, 4 Wheel, 8-10.5 cu yd Scraper, 4 Wheel, 12-15 cu yd Scraper, 2 Wheel, 14-18 cu yd (a)	155.0	165.7° 155.0 156.8 123.7	158.8 155.0 151.3 122.7	+ 4.3 0 + 3.6 + 0.8
Grader, light & medium	172.6	172.6* 171.1*	164.0 161.2	+ 5.2 + 6.1
Tracters (non-farm, incl Industrial)  Wheel-type, off highway (a)  Crawler-type, 45-60 dhp  80-120 dhp	128 2 191.9 196.4	187.8 128.2 191.9 196.4 191.3	180.5 128 4 182.6 185.8 186.7	+ 4.0 - 0.2 + 5.1 + 5.7 + 2.5
120 and up dhp	201.3	201.3	191.8	+ 5.0
Machinery, Tracter Meunted Oozer, cable controlled Dozer, hydraulic controlled Cable power control unit Loader, shovel type	154.4 186.6 151.4	154.4 186.6 151.4 161.5	161.7 151.6 177.3 147.9 153.9	+ 4.3 + 1.9 + 5.3 + 2.4 + 4.9
Specialized Machinery Ditcher Roller, tandem	153.7 156.6	153.7* 156.6 199.8*	150.3 154.1 193.2	+ 2.3 + 1.6 + 3.4
Roller, 3 wheel	170.2 150.5	170.2 150.5 110.0*	161.6 143.3 111.7	+ 5.3 + 5.0 - 1.5
Dewatering pump, 90 M gph	148.6	148.3	144.3	+ 3.0
Portable Air Compressors		185.5° 181.6	159.1	+ 4.0
Mixers, Pavers, Spreaders	155.8	155.8	149.2	+ 4.4
Mixer, portable, 11 cu ft	164.1 168.6 131.1	164.1 168.6 131.1	160.1 163.7 128.1	+ 2.5 + 3.0 + 2.3
Mixer, paving, 34 cu ft	191.6 191.5 122.3	191.6 191.5 122.3	185.2 173.0 127.4	+ 3.5 +10.7 - 0.1
Bituminous spreader	162.6	170.2 162.6	160.3 153.0	+ 6.2 + 6.3
Off-Highway Trucks, Wagons (b)	101.1	101.1 101.1 101.4	100.0 100.0 100.0	#11

• a January, 1955=100 • b January, 1958=100 • Revised BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

# Equipment Prices Rise Slightly Again

1 15 1 100

Manufacturers' list prices of construction equipment have changed little so far this year However, the scattered increases that occurred have caused a slow but steady uptrend in average list prices.

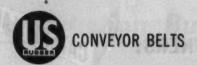
Though the Bureau of Labor Statistics price index showed only the smallest change in April, it was 0.6% above January. The index on April 15 was a record 171.8, based on 1947-49 prices as 100. This compares with the March 15 value (revised) of 171.7 and is 3.9% higher than a year ago.

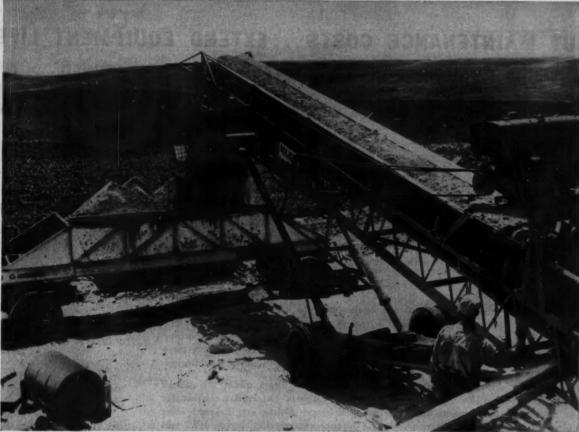
The slow price rise this year contrasts with the stability of prices early last year. But it follows the pattern of prices during early 1955, 1956, and 1957 when equipment buying was very strong. In 1958, however, orders were just starting to recover from a deep slump.

New orders for construction and mining machinery in April were second only to the record high set in March. The Orders Index dipped from 339 in March to 321 in April, according to the McGraw-Hill Economics Department, but April order volume was a thumping 33% higher than a year ago.

In the first four months of this year contractors have ordered 31% more new equipment (by dollar value) than last year.

The booming pace of construction contracts in May indicates that contractors probably will continue to order record amounts of new equipment. The contract award index rose to 313, up 29% over April. May was one of the biggest contract months ever recorded by Construction Methods, awards averaging almost \$500 million per week. This exceeds the peak month of the 1955-56 boom.





Stockpiled aggregates at crushing plant being conveyed into trucks via "U.S." Belt.

# "No maintenance, no repairs, no downtime,"

SAYS CO-OWNER OF BIG CRUSHING PLANT

Mr. John Weelborg (of Weelborg Bros., Dell Rapids, S. D.) is co-owner of a firm engaged in crushing aggregates and in chip-surfacing roads.

The rock (dug from nearby pit) is bulldozed into stockpiles. 5-ply belts in widths of 36", 30", 24", 20" then carry the rock to the crusher for processing. These same belts carry crushed rock and sand to trucks for transportation to road-building sites.

"In the 20 months since these belts were installed," says Mr. Weelborg, "there has been no maintenance, no repairs, no downtime. We couldn't ask for better belts."

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

This installation was handled by "U. S." Distributor W. S. Hott, Minneapolis



Mechanical Goods Division

## **United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

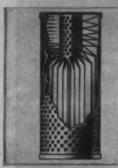
In Canada: Dominion Rubber Company, Ltd.

June 1959—CONSTRUCTION METHODS and Equipment—Page 41

#### SPECIAL REPORT TO CATERPILLAR OWNERS:



# CUT MAINTENANCE COSTS...EXTEND EQUIPMENT LIFE BY CHANGING OIL AND FILTERS AS RECOMMENDED



How often should lube oil and filters be changed? The answer is obvious—when the lube oil and filter can no longer do their jobs. But how do you know when that time comes? Can you afford to guess?

Guessing can be costly. The cost of oil changed more frequently than necessary adds up to big sums during a work season. Delayed oil changes can bring about premature overhauls with more parts replacement costs.

Monufacturer recommendations are based on sound principles. Rapid advancements have been made in perfecting "additive" lube oils that can reduce wear. The familiar ridge left in liners by the piston rings can be practically eliminated by the use of Series III Oils and proper maintenance practices? These oils also allow longer periods between changes.

Full benefit and savings from new oils cannot be had without proper filtering. Caterpillar Engines have an emergency by-pass valve that opens and allows unfiltered oil to circulate if the elements become clogged. And elements become clogged when their dirt-holding capacity is reached. Caterpillar elements have ample dirt-holding capacity to keep the by-pass closed over the recommended period.

But aren't the dirt-holding capacities of all makes of filters about the same? To protect the long life reputation of Cat Diesel Engines, Caterpillar continually tests all brands of elements affered for Cat Engines. Below are the surprising results, based on tests of filters purchased on the open market during 1957 and 1958. During these tests commercial test dust was gradually added to clean oil until each filter clogged and the emergency by-pass valve opened. The amount of dirt added is recorded in the "Sediment Index" column.



#### HOW CAT FILTERS COMPARE WITH OTHER BRANDS

Brand	Filtering Area (Square Inches)	Sediment Index (In Grams)	Comparison Used as basis for recom-
CATERPILLAR	1450	75	mended oil and element change periods.
BRAND A	1450	13	Cat element lasted nearly 6 times longer.
BRAND B	1170	22	Cat element lasted 3 times longer.
BRAND C	1000	34	Cat element lasted more than twice as long.
BRAND D	Not measurable	No oil flow	Opens by-pass immediately even when new.
BRAND E	1450	26	Cat element lasted nearly 3 times longer.



SERVICE TIP:

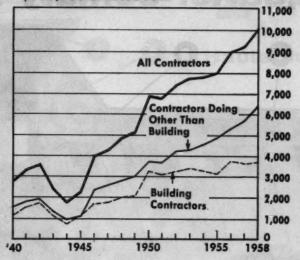
Get your copy of "Crankcase Lubricating Oil Change Recommendations," Form 32421-1W, from your Caterpillar Dealer right away. Keep pace with the new lube oil developments. Your Caterpillar Dealer has the complete story on the advantages of changing lube oil and filters as recommended. Ask him to figure your annual engine oil costs for you, and see how much you can save. See him today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

#### Construction Business . . .

#### 10,052 Contractors with Volume of \$100,000 or More . . .



#### .. Handle 20,071 Projects Costing \$14.3 Billion

Reported by Construction Methods & Equipment

	Number of Contractors Pro			Contract Value			
Type of Work					1958 6		
TOTAL-ALL TYPES	10,052	+ 9	20,071	+11	\$14,312	+ 5	
Total—Other than Building Waterworks Sewerage Bridges Highways and streets Earthwork & waterways. Airports Unclassified	587 1,136 1,122 3,151 685 1,044	+ 1 +13 +22 +16	1,496 1,562 7,105 828 1,371	-14 +11 +19 +21	551 638 3,411 957 946	-19 + 7 -12	
Federal (incl. above)	1,637	+33	2,176	+39	1,518	+14	
Total—Building	1,050	-15	1,338	-24	6,875 1,596 5,279	-41	
Federal (incl. above)	478	+175	492	+142	861	+147	

## **More Contractors Grow Bigger**

A RECORD number of 10,052 contractors handled at least \$100,-000 of new business last year. This is an increase of 818, or 9%, over the number that did at least \$100,000 of business in 1957

The 10,052 contractors took on 20,071 projects with a total cost of \$14.3 billion last year. The number of projects was 11% greater than the 1957 count, and the dollar volume was 5% above

Nearly all of the increase in the number of contractors who signed up at least \$100,000 of contracts was in the group doing otherthan-building construction. The number of contractors in this group increase by 760, or 13.5%, above the 1957 count.

Biggest increases, ranging from 16% to 39%, were in the number of contractors handling highway, bridge, and airport jobs. There also were more contractors engaged in construction of waterworks, sewerage facilities, dams, and wa-

The number of building contractors with \$100,000 or more of new business last year increased 1.6% to a record total of 3,664, just two above the 1956 record.

More building contractors handled school construction jobs than any other type of building project. There were 1,143 contractors with school construction jobs last

A total of 1,050 contractors took on industrial construction jobs. This was 15% fewer than the 1957 count and 25% below the 1956 record total.

Largest dollar volume for building contractors was in mass housing. A total of 514 contractors signed up \$1.6 billion of new contracts in 1958. Private office building contracts valued at \$640 million went to 228 contractors, and public office building contracts amounting to \$221 million were awarded to 116 contractors. Construction of shopping centers and stores gave 192 contractors \$320 million of new business.

In compiling these figures Construction Methods included only mass housing and non-industrial building contracts with a value of at least \$344,000. The contract minimum for industrial buildings was \$93,000; for earthwork-damswaterways, it was \$44,000; and for other public works and unclassified private construction, it was \$73,000.

The "Million Dollar Club"contractors with at least \$1 million of new contract awards during the year-increased its membership substantially in 1958.

The number of contractors with \$1 million or more of contract awards increased 12% to a record total of 3,559. That's about 35% of the total number of contractors with at least \$100,-000 of contract awards in 1958.

The "Million Dollar Club" has grown rapidly in recent years. From 1954 to 1958 its member-

continued on page 48

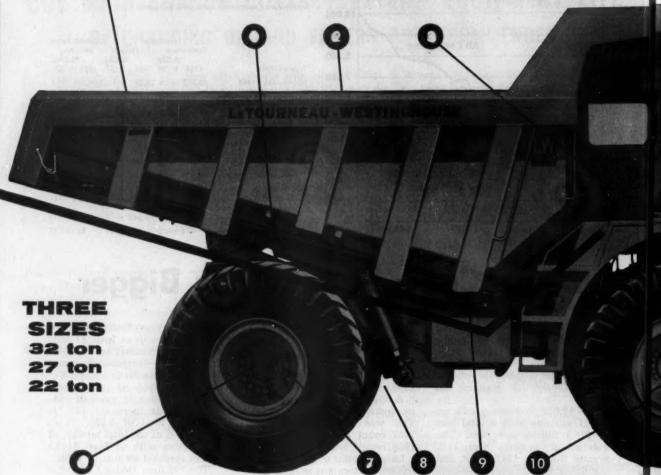
#### WHO GETS THE BUSINESS

The \$14.3 billion of new business for contractors with at least \$100,000 of contract awards last year accounts for 75% of the year's total contract volume as reported by Construction Methods.

A small part of the balance went to contractors with less than \$100,000 of contract awards. Most of the rest was handled by owner-builders of mass housing, commercial and industrial building, and unclassified private construction -mainly pipelines and tele-phone or telegraph projects.



the first <u>all-new</u> off-road truck in a quarter-century

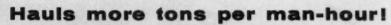


#### Look at these important advanced Haulpak features!

- 1. "Y"-shaped body gives you bonus yardage within a short wheelbase. Loaded material quickly fills all corners for big low-void pay loads. "Y" also provides a low center of gravity... gives Haulpak the stability needed for high-speed hauling over rough roads and steep grades.
- 2. Low loading height (only 10'1'' on the 32-ton size) and large top opening  $(14'5'' \times 11')$  makes it easy for shovel operators to load Haulpak fast, without spillage.
- 3. Big, roomy cab with canted windshield has many work-efficiency features.
- 4. Strong, protective canopy covers cab completely.
- 5. Positive power steer and sure-grip, auto-size steering wheel for safe, easy handling. Steering system is located high behind bumper, well protected from damage.
- 6. Exclusive power-transfer differential automatically transfers power to wheel on firmest faoting for maximum traction. This same, patented LW differential has boosted production and profits for thousands of LW Tournapuli® owners for more than 14 years...and now, for the first time, it is available on a truck.
- 7. Needs NO daily maintenance Haulpak's bearings never need lubrication . . . they're moly-coated to resist abrasion, packed in grease, and sealed for life. The entire Haulpak lubrication check needed only at 500-hour intervals consists of just 4 easily-reached grease filtings.

- 8. Has no springs, rides an Hydrair\* Haulpak's exclusive airhydraulic suspension system completely eliminates maintenance and repair of springs. 4 Hydrair units cushion against loading and travel shocks. System compensates automatically for off-center loading and keeps unit riding level over humps and holes.
- 100% rubber-mounted body cushions loading shocks. Engine, transmission, radiator, and cab are also rubber-mounted to minimize vibration.
- 10. Four separate braking systems two controlled by hand levers, two by floor pedal for fast, safe, sure stops. System includes Torquatic brake in the Haulpak transmission and big, disc-type air brakes on all wheels having 4 times the braking surface of conventional trucks.
- 11. "Power-Miser" fan standard on all Haulpaks, requires only 10 hp to operate, compared with the 30 to 35 hp needed for conventional fans. Thermostatically controlled, fan shuts off automatically when engine heat falls below efficient operating temperature...permits engine to maintain correct temperature, releases more horsepower for tractive effort.
- 180° turn in area only 44½' wide with a wheelbase of only 130", Haulpak turns in far less space than units of similar capacity. This unusual maneuverability permits Haulpak to spot, swing around, back up, and dump without lost motion to delay hauling cycles.

# Haulpak



This LW Haulpak is all new from the wheels up. It is the result of more than 3 years of research and development by LeTourneau-Westinghouse engineerspioneers of a long list of earthmoving and hauling equipment. Although brand new, Haulpak is a fullyproven truck. All three models have been put through rugged tests under the toughest working conditions for over 14 months - in mines, quarries, and on construction jobs. Its various parts and assemblies some of them tested and proved by millions of hours on LW Tournapulls all over the world - are much stronger than those on ordinary haulers. With the all-new LW Haulpak truck you can be confident your truck maintenance, repair, and operating costs will drop to a new low . . . and your hauling tonnage will climb to new highs!

Check the job-tested Haulpak features listed here. Then visit your nearby LeTourneau-Westinghouse Distributor...let him give you detailed specifications on the new Haulpaks. Call on him soon!

\*Trademark HP-J099-G-3

## LW Parade of Progress continues:

The new Haulpak truck is the latest addition to an impressive line of new and improved earthmoving and hauling machines being unveiled by LeTourneau-Westinghouse Company. They're part of LW's continuing program of product development to give you highest production equipment at lowest ownership-operating cost.





LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

# ...Standard of the Industry

# Moves more pay-yards per hour... at lower cost than any other scraper in its class

For years, the C Tournapull has been acknowledged as "The Standard of the Industry" in fast, self-propelled scrapers. It offers you easier loading, faster hauling, quicker spreading... plus longer, trouble-free life... than any competitive scraper made.

Thousands of these high-production machines are in use around the world. Some of the reasons they've gained this tremendous acceptance in earthmoving are listed below. Review them, and you'll see why time-tested C 'Pull\* is your best investment in medium-sized scrapers:

#### FULLPAK® SCRAPER DESIGN ...

lower, wider, for better boiling action, fewer voids, bigger pay-loads per cycle.

#### CHOICE OF ENGINES ...

choose either the 226-hp GM 6-71 or the 210-hp Cummins HBIS-600.

#### CHOICE OF TRANSMISSIONS ...

the only scraper in its class that gives you a choice of step-gear transmission or a power-shift transmission teamed with low-pressure torque converter.

#### POWER-TRANSFER DIFFERENTIAL ...

permits "C" to operate in slippery, muddy conditions that stop other scrapers.

#### ELECTRIC CONTROLS ...

fast-acting, fingertip controls pinpoint accuracy, with the easiest-to-operate, easiest-to-maintain system of all.

#### INTERCHANGEABILITY...

exceeds any other make of scraper, with Rear-Dump, Bottom-Dump, and Flatbed haulers interchangeable, at low cost, behind the Tournapull prime-mover.

#### GREATER SAFETY ...

with the biggest brakes in the industry, superior visibility, instant electric control and power steer that is not affected by the operation of any other controls.

#### MORE MANEUVERABILITY ...

electric king-pin steer can U-turn C 'Pull in less than its own length, for fast, easy maneuvering in tight quarters, narrow haul roads.

#### LOW OPERATING COSTS ...

you save money every day because of the features listed above, plus "C's" simple, rugged design, easy accessibility of component parts, minimum of lubrication points, and low requirements for fuel, cable, oil, and tires.

\*Trademark CP-2141-DC-2



#### LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



# C TOURNAPULL



18-YD heaped ... 226 HP ... 33.5 MPH

Get complete specifications from your LW Distributor. He can show you verified job histories of this machine...and, when you're ready, he'll arrange a working demonstration of a C'Pull. He can help you, too, with advantageous tradeins and financing. See him at your earliest opportunity!

ship increased 57%. Most of the new members are contractors handling highway, bridge, airport, and sewerage projects. The total number in 1958 was 2.053. up 20% from 1957.

The number of building contractors, on the other hand, is not growing so fast. The number doing at least \$1 million of business in 1958 was up only 3% over 1957 and only 26% over 1954.

The number of contractors with between \$500,000 and \$1 million of new business in 1958 was up 14% over the 1957 total. Since 1954 their number has grown by 35%. Most of the increase is infirms doing heavy construction other than building.

Firms in the \$100,000 to \$500,-000 class increased only 4% in 1958, but that was enough to establish a new record. There were, however, 4% fewer building contractors in this group in 1958. Since 1954 the total number of contractors on all types of work in this group has increased only 10%.

## Roadbuilding Competition Is Stiff

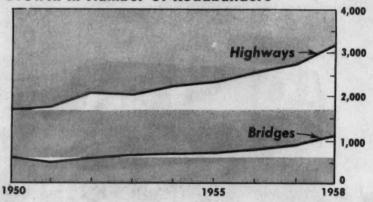
The sharp increase in the number of contractors handling highway construction makes this probably the most competitive type of work in the heavy construction field, even though the volume of new highway work going to contract is at a record level.

The reason is that highway building capacity is increasing by leaps and bounds. In the eight years between 1950 and 1958, the number of highway contractors doing \$100,000 or more total new business per year increased 82% -from 1,727 in 1950 to a record 3,151 in 1958. An even faster rise has come in the number of bridge contractors-from 595 in 1950 to 1,122 in 1958, an increase of 89%.

These numbers represent only a part of the growth in highway construction capacity. The rapid mechanization of the highway contractor also has increased his capacity, thus compounding the competitive effect of more firms actively bidding. As the country's highway contractors have grown in number and individual capacity, their appetites for work have increased. They have to line up more and more work to keep their expanded crews and equipment spreads at work. So profit margins generally are small.

Though highway and bridge construction markets are expanding, the rate of increase is starting to slow down. A few states already have begun to cut back on their contracting plans this year, largely because the changed formula for allocation of federal aid gives them smaller amounts for interstate highway construction in fiscal 1960 than in fiscal 1959. Most states will continue to increase their awards this year and next, but a minority of 10 states will cut back in 1960.

#### Growth in Number of Roadbuilders



**Highway Bid Price Trends** 

Indexes, 1949 = 100 (except as shown)

1st Quar-	1st Quar-	4th Quar-	1st Quar-				958 -		195
for	ter	fer	fer		1st Quar-	2nd	3rd Quar-	4th	Isl
California 145.6	126.8	125.1	113.3		ter	ter	ter		
Colorado 86.4	93.7	92.7	97.2	California	9.3	5.4	5.5	6.3	8.
Florida 129.4	133.9	139.6	42.6	Colorado _			8.4	9.6	
Idaho(a) 95.9	105.5	90.5	97.6	Florida	7.1	5.5	5.0	5.9	5.
Nevada (b) 105.5	117.2	103.3	110.0	Nevada	8.8	6.6	5.7	7.1	5.
New York 134.8	136.6	112.1	121.6	New York		6.0	6.0	5.0	8.
Oregon 103,6	91.7	96.6	111,2	Oregon	10.4	6.5	5.9	8.5	6.
S. Dakota 87.1	82.8	96.7	100.0	S. Dakota		5.8	6.8	6.4	6.
Texas 119.6	121.6	128.3	130.3	Texas		4.7	5.7	5.9	6.
Washington 107.9	101.5	96,3	1.88	Washington	9.1	6.0	4.9	8.0	9.
US (c) 116.4	114.6	115.6	115.0						
(a) 1950=100	(b) 195	5=100	(e)	Bureau of Pub	lic Ro	ads C	ompos	ite k	Aile

1957 - 1958 - 1959

As contractors spread their operations from states where available work tapers off to those where contracts are climbing, competition will intensify in the låtter states.

The dramatic effect of competition on highway bid prices in 1958 and 1959 shows up in the bid price indexes reported by the Bureau of Public Roads and individual state highway departments.

Average Number Bidders Per Project

6.5 5.9 8.5 6.9

5.7 7.1 5.7

5.0 8.2

The BPR Composite Mile Index for bids on federal aid highways moved down to 167.6 in the first quarter, based on 1925-29 =100. This is about 2% under the record high set in the final quarter of 1957. Moreover, it is only a whisker above the third quarter of 1956, when the inter-

# NEW FRAM DOUBLE AIR FILTER CARTRIDGE AIR FILTER GIVES DOUBLE SAVINGS!

\*Cuts Cartridge Costs \* Cuts Maintenance Costs



Now FRAM offers—for extremely dusty conditions a new line of heavy-duty dry air filters with *precleaner* cartridges that give your engines complete dust protection—at great money savings!

These new filters utilize the famous FRAM "Filtronic" Cartridge with additional precleaner cartridge protection.

Tests show that three of these inexpensive precleaners can be used during the life of each FRAM "Filtronic" Cartridge! This means triple life for the main cartridge ... fewer "Filtronic" cartridge changes ... a new low in cartridge costs! This new filter is so efficient that even under abnormal dust conditions it assures long engine life ... fewer engine overhauls.

FRAM supplies a complete line of these heavy-duty filters—to meet air intake needs of engines requiring from 225 to 1000 CFM! For complete information, write FRAM CORPORATION, Providence 16, R. I.

#### **HOW IT WORKS**

1 Dirty air enters perforated grill. 2 It passes through precleaner cartridge which removes soot and fine dust.

3 Air then continues to inner main "Filtronic" cartridge which

removes 99% plus of all other impurities. 4 Clean air then leaves the filter and enters the engine air induction system.



#### ENGINEER'S FIELD REPORT

PRODUCT

RPM TRACTOR ROLLER LUBRICANT

PIDM

THOS. SCALZO CO. Seattle, Washington

## Just 3 new track rollers in 4 years' tough service



Granite Boulders put a real strain on track rollers, but this Allis-Chalmers HD20, using RPM Tractor Roller Lubricant, A/C Type, has replaced only three rollers in four years of working under such punishing conditions. Tractor is operated by Thos. Scalzo

Co., specialists in earth-moving projects. RPM Tractor Roller Lubricant gives this operator an average life of 3,000 hours for track rollers on equipment in heavy-duty service. After 3,000 hours, rollers are switched to equipment in lighter duty service.



Pulling a Grid Roller, this Caterpillar D8 tractor is another of Scalzo Co.'s 14-tractor fleet—all of which use RPM Tractor Roller Lubricant. Says Vic Scalzo, "In spite of rough service under all kinds of conditions, in 15 years we have never had to replace a

track roller because of lubricant failure. Our onthe-job experience and our service records prove that RPM Tractor Roller Lubricant has been doing a good job for us since we started using it in 1941."



PRAREMARE "RESH" AND DESIGN

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

## How RPM Tractor Roller Lubricants resist wear in toughest service



- Flow evenly to all bearing surfaces—retard rusting.
- Chemical agents maintain tough lubricating film and stability.
- Additive materials keep lubricant on bearings, resist leakage, helps form protective seal for bearings.
- Lubricants meet specifications of all tractor manufacturers.

For More Information about this or any other petroleum product, or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF TEXAS, El Paso THE CALIFORNIA COMPANY, Denver 1, Colorado

#### CONSTRUCTION BUSINESS ...

continued

tate highway construction program took effect. Yet construction costs increased 12.5% between July, 1956, and March, 1959. During this same period, manufacturers' prices of construction equipment increased by 16.1%.

Several states show prices dropping much more than the BPR's index for the U.S. as a whole:

• Bid prices on California highway jobs let in the first quarter were the lowest since 1955 and a whopping 22% below the peak in the first quarter of 1957. The average number of bidders jumped to 8.2 per project in the first quarter.

• Colorado highway bids, though edging up in the first quarter, were 8% under the mid-1957 peak. And they continued to be lower than in 1949. However, the number of bidders dipped to 7.8 from 9.6 in the first and fourth quarters of 1958.

• Florida bid prices, though on the upgrade in the two latest quarters, were 3% under the record level of the third quarter of 1958. The number of bidders has been fairly steady since the second quarter of last year.

• Idaho highway bid prices have been lower than 1955 since the third quarter of 1958 and are far under the 1957 high. The average number of bidders remained high at 7.1 in the first quarter.

• Nevada bid prices are 18% below their 1957 high, though they rose in the first quarter of this year. The number of bidders has tapered off.

• Oregon prices rose sharply in the first quarter, nearly reaching the six-year high of 1957's high of 1957's second quarter. The number of bidders dropped.

• South Dakota highway bids have also rebounded early this year to near previous highs. But there was a slight increase in the average number of bidders at first quarter lettings.

• Texas bid prices edged upward in the latest quarter, but were less than the record high set in the third quarter of 1958. The number of bidders increased to the highest in over a year.

 Washington highway bid prices tumbled in the first quarter to their lowest since late 1955. The number of bidders rose to 9.8.

Contracts Awarded on page 54



#### OKLAHOMA INTERSTATE 40 TAKES SHAPE FAST:

## Haskins Beats Schedule on Four Consecutive Contracts

Ben Haskins, Cordell, Oklahoma, contractor, finished his fourth contract on Interstate highway 40 in Oklahoma 35% ahead of schedule. The first three were handled with similar speed. Interstate 40 is a new four-lane, controlled access highway which, when completed, will link Los Angeles, California, and Durham, North Carolina, with connecting Interstate routes to the Atlantic Coast. On his fourth contract—a

1,200,000-yd, \$497,000 job at the west edge of Clinton, Oklahoma—Haskins timed his Allis-Chalmers motor scrapers at 7.5 minutes per 3.26-mile cycle. Deducting 30 seconds for loading, Haskins had 7 minutes left for travel and spreading... a remarkable 27.7 mph average. These units are rated conservatively by Allis-Chalmers at 27.9 mph in fifth gear.

About 50% of the hauling was upgrade . . . averaging 3%. The motor scrapers had to negotiate a 15-ft dip from haul road level to detour around a bridge. The TS-260's took this detour in fifth gear. Another 2,000 feet of the haul road passed through a business district in suburban Clinton on existing Route 66. Regular traffic was maintained.

The Oklahoma Interstate 40 jobs handled by Haskins called for loading sandy clay, sandstone and

shale. Most of it was ripped for fast, efficient loading. Two unusual cuts were encountered—55 and 65 feet deep, 1,000 feet long and about 400 feet wide at the top.

To handle jobs like this in less than scheduled time takes topnotch equipment. Haskins is proving he has it. His selection of motor scrapers was made after he timed loading cycles, scaled loads and recorded travel speeds to determine comparative yards moved per hour by the three leading makes. He chose Allis-Chalmers TS-260 motor scrapers. The rest of his fleet, all Allis-Chalmers, was selected just as carefully.

Ben Haskins' extreme dedication to detail both in the planning of his jobs and the selection of equipment has been rewarded with fast . . . yet solid growth for his 13-year-old company. Haskins personally checks every job to be bid . . . every machine to be considered for purchase. The unusual efficiency of his operations and

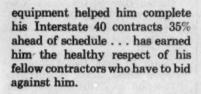


Part of Haskins' Allis-Chalmers fleet is shown in a big cut on one of his early Oklahoma Interstate 40 jobs.

... move ahead with



Ben Haskins, Contractor Cordell, Oklahoma



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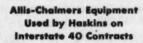
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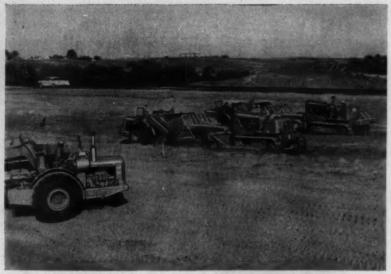
nd

Haskins figures on . . . and gets better than 90 per cent availability of equipment during the 270 tenhour working days he averages each year. You are entitled to performance like this on your jobs. You'll get it with Allis-Chalmers construction machinery. Your dealer has the equipment, facilities and know-how to put you out in front of your schedules. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



T5-260 motor scrapers
HD-21 crawler tractors
HD-16 crawler tractors
HD-11 crawler tractor
HD-11G tractor shovel

FORTY FIVE motor graders



Some of Haskins' new TS-260's loading tough clay, sandstone and shale. The material was ripped for most efficient handling.



Averaging a remarkable 27.7 mph on the haul, these Allis-Chalmers motor scrapers completed 3.26-mile cycles in 7.5 minutes.



Allis-Chalmers FORTY FIVE motor graders maintained fill and haul roads . . . helping motor scrapers make high speed cycles.



TS-260 230 hp, 17 yd heaped, 44,800 lb



ith ALLIS-CHALMERS ... power for a growing world

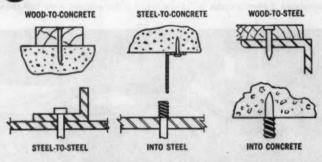
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## "covers all the bases in powder-actuated fastening"

This statement has been made by hundreds of contractors. architects, electricians, plumbers, maintenance men, supervisors, foremen and others over the past ten years! Whatever the job, if it involves fastening into concrete or steel Ramset can do it more easily, efficiently, and with a lower in-place fastener cost.

Threaded studs, drive pins, eye pins-over 100 specialized fasteners team with ten types of powder charges to assure you of just the right holding power for each job. It will pay you to get more details. Your Ramset dealer is listed in the Yellow Pages under tools...call him today!



In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set hammer-in tools for light fastening, and Ringblaster® heavy-duty kiln gun.

Ramset Fastening System

WINCHESTER-WESTERN DIV. . OLIN MATHIESON CHEMICAL CORPORATION 12103-F BEREA ROAD . CLEVELAND, OHIO

#### SOME BIG CONTRACT AWARDS OF THE MONTH

J. H. Pomeroy & Co., Hawaiian Dredging & Construction Co., Lincoln Development Co. & J. A. Warford, 120 Montgomery St., San Francisco Calif. A joint venture to construct a residential and resort area at Lake Tahoe, Calif. to include dredging and fill for 17 mi of waterfront, 2,500 residences, hotel and convention buildings, shopping center, marine, and beach recreation area. \$150,000,000.

Gut F. Atkinson Co., 10 W. Orange Ave., San Francisco, Calif. Construct north shore section of Ice Harbor Dam on the Snake River near Pasco, Wash. Corps of Engineers, City-County Airport, Walla Walla, Wash. \$20,744,405.

Henry C. Beck Co., Fulton National Bank Bldg., Atlanta, Ga. Erection of Coliseum and Merchandise Mart at Lawrenceville, Ga. Southwestern Merchandise Mart, Inc., 680 West Peachtree St. N.W., Atlanta, Ga. \$15,000,000.

Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, Construct steel water main from Sipsey Fork on the Black Warrior River to Pratt City, Ala. Industrial Water Board, City Hall, Birmingham, Ala. \$13,228,013.

L. E. Dixon Co., 409 South California St., San Gabriel, Calif. Erect administration area facilities to include buildings, roads, utilities, and sewage plant at Naval Air Station, Lemoore, Calif. Dist. Public Works Office, 12th Naval District, San Bruno, Calif. \$8,752,000.

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McCloskey & Co,. 1620 W. Thompson St., Philadelphia, Pa. Construct a one-story, 280,000sq-ft manufacturing plant and office. Crown Cork & Seal Co., 9300 Ashton Rd., Philadelphia, Pa. \$7,000,000.

Independent Contractors & Engineers, 1407 S. Akard, Dallas, Tex. Construct missile launching site and service buildings at Forbes Air Force Base near Topeka, Kan. Corps of Engineers, 1800 Federal Office Building, Kansas City, Mo. \$6,462,384.

Blaw-Knox Road Widener lays aggregate for shoulders in conversion of U.S. Highway 31 to Interstate Highway 65 near Birmingham, Alabama. A. E. Burgess Company bought the Blaw-Knox machine especially for the 250,000-yard job.

# 'We are laying over 2500 cubic yards per day with our Blaw-Knox Road Widener"

"This represents a 50% increase in production over any other system that we know of. Our current cost per-cubic-yard adds up to an approximate \$200 saving each day. And the machine requires only one man for its operation," says Sam Sheperd, project director, A. E. Burgess Company, Birmingham, Alabama.

"For example, the Blaw-Knox Widener charges and discharges simultaneously. This makes it possible for us to use 20-yard dump trucks, placing a 20-yard load in five minutes," Mr. Sheperd adds.

Burgess was able to achieve optimum operation

exactly one hour after the machine was delivered to the job. He said, "A Blaw-Knox engineer was on hand to instruct the operator and line up the equipment. And since that time, our Blaw-Knox distributor has been out several times to check the operation."

Specially engineered, rugged Blaw-Knox Wideners are delivering outstanding performance for contractors all over America. Equipped to lay aggregate, concrete, or bituminous materials, they can turn your next widening or shoulder-building project into a production line. See your Blaw-Knox distributor for details or write for a copy of Bulletin 2647.



#### BLAW-KNOX COMPANY

Construction Equipment 300 Sixth Avenue Pittsburgh 22, Pennsylvania

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# 6 Crawl-IR drills deliver POWER-HOUSE PUNCH at Rocky Reach Dam

This concentrated battery of fast-acting, mobile drilling power is sinking 25 to 30 foot holes for the main power house excavation at Rocky Reach Dam on the Columbia River, north of Wenatchee, Washington. Under construction by the Rocky Reach Contractors, this major project is a joint venture sponsored by the L. E. Dixon Company of San Gabriel, Cal. For high sustained drilling speeds, these six Ingersoll-Rand Crawl-IR drills are using 2%" Carset bits and I-R Carburized Drill Steels.

The Crawl-IR units are also used to drill 90 foot grout holes around the circumference of the coffer dam.

Ingersoll-Rand Crawl-IR drills are completely mechanized, heavy-duty units that convert setup time into drilling time. All motions—raise, lower, horizontal swing, extend, retract, and tower dump and swing—are powered by large, double-acting hydraulic cylinders, throttle controlled from a central operating station on each drill. Rugged I-R air traction motors, independently controlled, move the drill from place to place—permit fast, accurate hole spotting.

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Ask your Ingersoll-Rand rock drill engineer for the inside story on why Crawl-IR is the strongest, most rugged crawler drill ever developed. Or send for new Bulletin No. 4208.



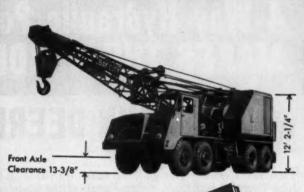
A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR ROCK DRILLING

# 40 TON CRANEMOBILE®



40 Ton, 8 wheel CraneMobile raises maximum boom and jib . . . without assistance.

The new BAY CITY 8 wheel CraneMobile has been designed and built for heavy-duty service, convenience and safety . . . economy and ease-of-operation . . . for greatest stability and best load distribution. It has a nominal crane rating of 40 tons at 12 foot radius with 40 foot boom over side or end with outriggers set. The long wheel base gives outstanding roadability, the big engine has plenty of power for off-the-road service or highway travel at selective speeds. Vehicle weight may be readily stripped down to 17,270 lbs. per rear axle and 13,120 lbs. per front axle. Overhead clearance height only 12' 21/4".





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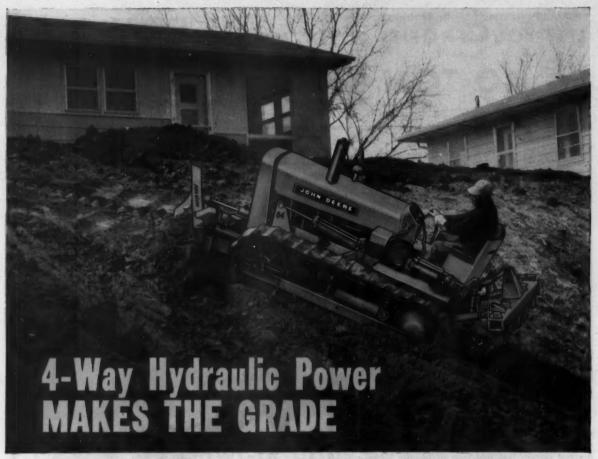
A NEW 40 TON CRANEMOBILE CATALOG that gives complete information on design features and construction of this new eight wheel carrier, is available now. It's free. Send for it today.



THE WORLD'S BEST BUILT SHOVELS AND CRANES

BAY CITY SHOVELS INC., BAY CITY 2, MICHIGAN

283



# with the JOHN DEERE 64 BULLDOZER

TRICKY terracing jobs go a lot faster with this all-hydraulic John Deere 64 Bulldozer. Because angle of the blade can be reversed on the go, no deadheading is necessary—every pass speeds the job along.

Hydraulics control tilt, lift, and down pressure, too—right from the operator's seat. Manual clutch-type direction reverser is another time saver that cuts operator fatigue as well.

In the 64 Bulldozer, Deere weight and size provide full maneuverability and make it safe to grade next to foundations and over septic tanks, reducing costly handwork.

#### Diesel or Gasoline Power

You can get a John Deere 64 Bulldozer with either Diesel or gasoline power—whatever best fits your needs—and all units have a new heavy-duty transmission with working speeds specially developed to give you full advantage of these efficient power plants.

See the 64 at your John Deere Industrial Dealer's or write for detailed literature today.

#### Immediate Ownership Through the John Deere Credit Plan

This modern, flexible financing plan has enabled hundreds of contractors to get started on better-paying jobs and to add to their equipment spreads. Your John Deere Industrial Dealer has all the details.

John Deere Industrial Division Dept. 552, Moline, Ill.

JOHN DEERE



"Specialists in Low-Cost Power with a Heavyweight Punch"

#### Let's Pave with More Tha GOOD INTENT

Paving schedules are always tight at bes And inclement weather, material shortages, late deliveries, equipment downtime - all often combine to defeat the best of intentions. But it's difficult to explain to the public.

Your answer may be found in the high daily production of the SEAM N ANDWALL PULVI-MIXER. And in the faster, superior compaction provided by the big, highly maneuverable 7 to 20 ton SEAMAN-ANDWALL Pneumatic Compactor. They're a great team for finishing ahead of schedule - whether its a city street or highway paving.

The PULVI-MIXER on most work will mix any road material with any type of binder at the rate of a mile a day of 24 foot wide pavement. And it leaves the mix perfectly blended, shaped to crown and grade - ready for the 5620 Compactor.

There are better earnings for the contractor and public good will for the highway or street authorities - in "finishing ahead"...So, let SEAMAN-ANDWALL equipment convert good intentions into

reality with low cost, low maintenance, high loadbearing, stabilized pavement.





5620 Pneumatic Compactor closely follows TRAV-L-PLANT. 5620's "straight down" compaction principle prevents scuffing or material displacement.

#### SEAMAN-ANDWALL

CORPORATION

A Subsidiary of American-Marietta Company





Here are 2 Bulletins, one on the PULVI-MIXER and TRAV-L-PLANT, the other on the 5620 Compactor. They're yours for the asking. Just send a postcard. We'll send them to you - promptly.

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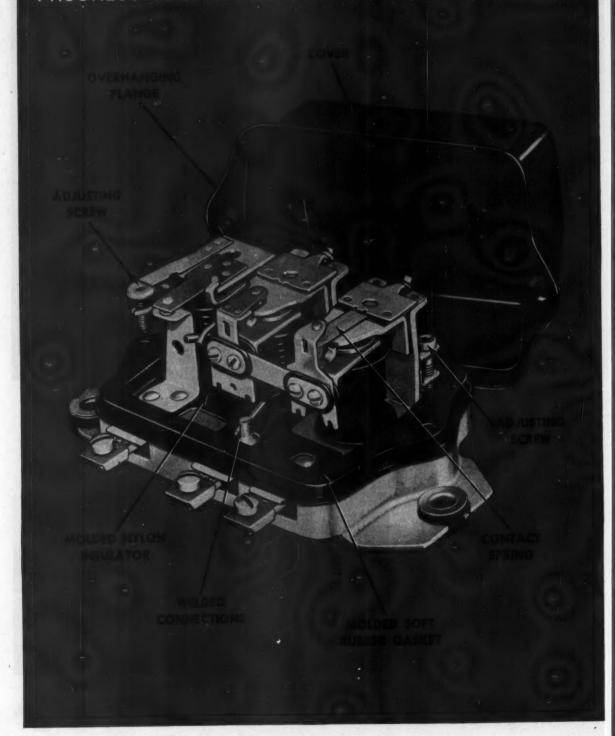


TRAV-L-PLANT pumps water from tanker in salt stabilization. Highway job was at 11,000 ft. altitude.



SEAMAN-ANDWALL PULVI-MIXER operates right up to curb on city street.

PROGRESSIVE ENGINEERING MAKES THE DIFFERENCE



# DELCO-REMY <u>WATERPROOF</u> REGULATORS NOW AVAILABLE FOR ALL POPULAR AMERICAN CARS

Better electrical performance and greater dependability in any weather are important user benefits found in Delco-Remy's waterproof standard generator regulators, now available for general replacement use.

And here are the features that make them the right regulators for all popular American cars and trucks.

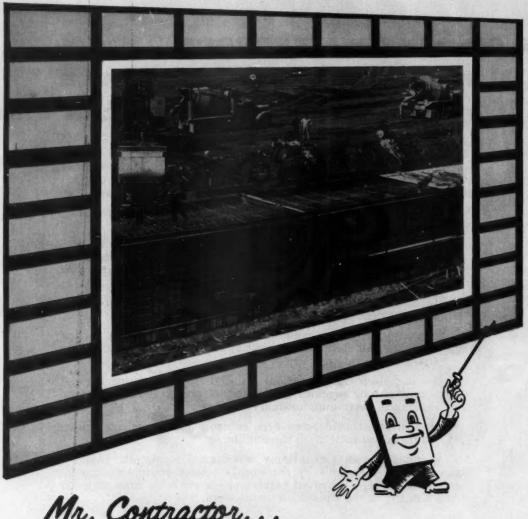
- New overhanging one-piece formed steel cover and mating base shed road splash . . . convenient attaching screws are *outside* the enclosed area. Molded soft rubber gasket seals out harmful oil and water vapors.
- Integral sleeves of molded nylon insulator form permanent seal around rivets—assure watertight base.
- New, longer, more flexible armature contact spring on voltage regulator unit assures more positive closing of contact points for smoother operation.
- Welded electrical connections and highest quality tungsten and non-tarnishing precious metal contact points assure minimum resistance, maximum durability.
- Special fine thread screw-type controls allow easy, highly accurate adjustment of all three units.

Always replace with Delco-Remy waterproof regulators. Built to highest quality standards by the world's largest original equipment manufacturer, these improved regulators are available from your car or truck dealer or the United Motors System.

DELCO-REMY . DIVISION OF GENERAL MOTORS . ANDERSON, INDIANA



Delco Remy



Mr. Contractor ...

Millions of square feet of Uni-Form Panels have been used to form concrete on thousands of jobs -Our experience of more than 45 years of specialization in every phase of concrete forming is at your disposal. May we be of service to you? Write for our Catalog 759.

UNIVERSAL FORM CLAMP CO. 1238 N. KOSTNER AVENUE . CHICAGO 51, ILLINOIS

"Products from the Gold Toobsoom"

BRANCH OFFICES and WAREHOUSES:

ATLANTA BALTIMORE CLEVELAND HOUSTON LOS ANGELES SAN LEANDRO TORONTO

PEAK POWER OUTPUT FOR HEAVY-DUTY EQUIPMENT ..

# HYDRA-DRIVES\_

**POWER SHIFT TRANSMISSIONS** 

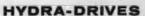
## and TORQUE CONVERTERS

Rockwell-Standard's Hydra-Drives units make hard work easy for heavy-duty equipment. The result...smooth, efficient, economical operation. A torque converter and 4-speed transmission in one compact package, the Hydra-Drives Power Shift Transmissions have been proved in hundreds of vehicles. They eliminate engine lugging and heavy shock loads. A 3-to-1 torque multiplication makes starting fast and effortless—even with heaviest loads.

Just a flip of the operator's lever accomplishes power shifts without interruption of the power flow. Automatic features of the converter and ease of power shifting simplifies operator training and lengthens vehicle life.

With four speeds forward and reverse, the Hydra-Drives Power Shift Transmissions are ideally suited for vehicles which must travel in both directions during a normal work cycle.

Hydra-Drives Torque Converters are the simplest, most efficient made. They can be matched with any transmission for easier, more efficient operation.



BDB

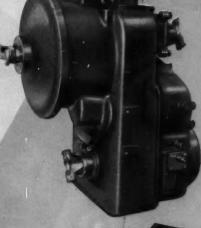
#### **Transmission**

- Four speeds forward and reverse.
- Full power shifting.
- For equipment up to 175 h.p.





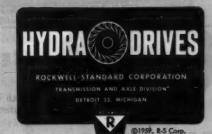
- 3-to-1 torque multiplication.
- Available separately, or with Hydra-Drives Transmission.
- For vehicles up to 500 h.p.



# CDB

- Four speeds forward and
- Power shift in each range both forward and reverse.
- For equipment up to 250 h.p.





Products of ROCKWELL-STANDARD Corporation



No. 1474 1/4" No. 1477 %"

The No. 1474 1/4" and No. 1477 3/4" Heavy Duty SIOUX Electric Drills are new in power, torque and entirely new in mechanical design. Brushes located at the fan position in front of the drill permit inspection and replace-

ment without even partial disassembly of the drill, It results also in a cooler running. longer lasting drill.



#### PORTABLE GRINDERS

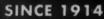
A Dependable, Heavy Duty Tool for Grinding, Buffing, Wire Brushing. 5" and 6" Wheel Diameters. Carefully Balanced for Easy Handling.

Sioux Quality Throughout

**TOOLS** 

#### HIGH SPEED HOLE SAWS

SIOUX high-speed. steel-teeth hole saws will cut holes from 1/4" to 6" in diameter, to a depth of 11/8" in free machining material. Steel (round or plate), brass, aluminum, bronze, wood, or plastic may be cut with these saws. Alloy or stainless steel must be cut at very slow speed.



SIOUX wire wheel brushes are durably built of special brushing wire, with wide face, even trim and perfect balance. Knot type provides high brush flexibility for cleaning heavy scale, rubber deposits, welding preparation. Torque or saucer shape brushes are for body repair, removing paint, scale or corrosion, cleaning welded joints, etc.



WIRE WHEEL

BRUSHES

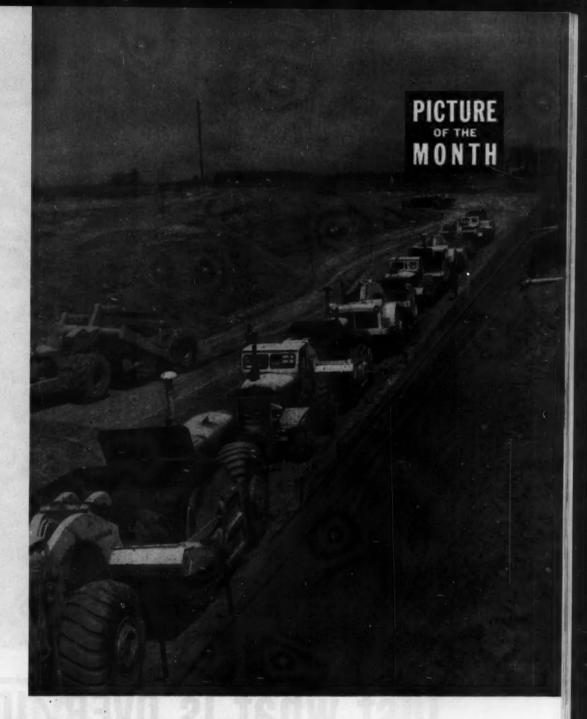


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SIOUX CITY, IOWA, U.S.A.

AIR IMPACT WRENCHES . AIR SCREWDRIVERS . ELECTRIC IMPACT WRENCHES . ELECTRIC SCREW-DRIVERS . GRINDERS . SANDERS . POLISHERS . FLEXIBLE SHAFTS . PORTABLE SAWS . VALVE GRINDING MACHINES . ABRASIVE DISCS



## Hard-Working Rigs Take on Fuel

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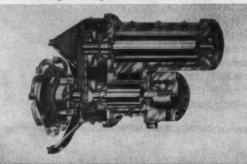
• Scrapers get diesel fuel by gravity feed through multiple pipes from storage tanks on top of an embankment. No fuel pumps are needed. Esso Standard Oil Co. installed this refueling station for Blythe Brothers Co. of Charlotte, N.C., at the site of an industrial plant and highway relocation job near Charlotte. The contractor's big fleet of earthmovers worked 10 hours a day on this job, moving a total of just about 1,000,000 cu yd of earth over haul roads that averaged about 1,500 yd long in only 50 working days.

BLUE BRUTE rotary with over Junder design

A vital question to all rotary compressor users

# Just what is over under e

Over/Under design. Many of the benefits of the Blue Brute rotary are a direct result of Over/Under design which puts the second stage of compression underneath the first.



The engineer that designed the new Blue Brute rotary compressor two choices. He could have taken the path of least resistance and duced a carbon copy of most other rotaries on the market. Or could have tried for something better.

Worthington hires engineers not only for their creative ability, also for their courage to attack difficult problems. Solution of the gineer assigned to this all-important compressor project was unique He designed the Blue Brute rotary with the second stage of comp sion underneath the first-instead of end to end. (Our sales departm calls this the "Over/Under" design.)

This Over/Under unit wasn't easier to design. Or to build. But it have one big advantage. It resulted in a vastly improved rotary wanny benefits for the man who owns it. The cylinders are self drain

\*Patent No. 2780406

ps clog emove

design of w ch that also kn run u e than

also spe s-85',

ributor ion 60 nada)



Easily accessible — all principal Blue Brute working parts can be removed and replaced using ordinary tools. With outboard end of each cylinder exposed you can make inspections and adjustments on the spot.



Easier starts, longer life are due to clutch which lets you warm up engine without engaging compressor. Easy for operator to engage, clutch adds years of extra life, saves hundreds of maintenance dollars.



Eliminates compressor blade demage by assuring proper draining of oil during shutdown. Self-draining cylinders permit gravity flow of oil so no sludge can collect to restrict flow, break blades.



Chain-drive life of many thousands of hours according to actual field tests. Extra heavy-duty chain proven to be reliable and durable on many types of construction equipment. Also, no shock problems thanks to prestretched chain.



More efficient oil separation cuts filter replacement costs. Two-stage design is: 1) lifetime Vortex unit which removes 95% of oil, and 2) vertical filter which removes remaining 5%, is inexpensive, easy to replace.



ps clogging) and easy to get at for repairs. All principal parts can emoved for inspection and replaced in a hurry.

Elesign?

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of the unique comp

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But it tary v designer didn't stop there. He knew that rotaries are used in all s of weather and under all kinds of conditions. So he added a ch that permits easy cold weather starts and longer engine life. also knew that contractors have to worry about the little things run up their costs. So he put in two oil filters, which save you than \$100 every time you need a filter change.

also specified that Blue Brute rotaries be built in the most popular s-85', 125', 210', 315', 365' and 600'. Ask your nearby Blue Brute ributor for a demonstration. Or write: Worthington Corporation, ion 60-18. Holyoke, Massachusetts. In Canada: Worthington nada) Ltd., Brantford, Ontario.





In most every field a boy is often sent to do a man's job because it costs a little less at first. In every case, experience and stamina are finally needed to get the job done faster — and at lower cost.

It's the same with masonry cutting blades. There's a lot of "boy" blades being sent to do a man-sized cutting job, but there's one sure way of separating the two — put them to the test!

For your "men-from-the-boys" test, call your nearest Clipper Factory Trained Representative. He's on call day or night with just one job: serving your masonry and concrete cutting needs with Premium Quality Diamond, Break-Resistant and Abrasive Blades. He'll conduct an eye-opening "separation" test right on your job, without cost or obligation, and will UNCONDITIONALLY GUARANTEE that man-sized Clipper Blades, will out-cut...out-perform...and out-last any other blade.

For FREE TRIAL or DEMONSTRATION on your job, of a Clipper SUPERMATIC Masonry Saw—or Clipper Concrete Saw, call collect Today.



#### MANUFACTURING COMPANY

General Offices and Factory

2814 WARWICK, KANSAS CITY-8, MISSOURI Factories in ENGLAND—FRANCE—GERMANY—ITALY







V-8's

Presenting 24 engines featuring

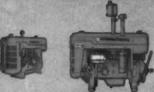
6's



13/3/3/3/5/F

4's

16.5 to 385 hp diesel and carburated



UC-60 16.5 max. eng. hp



42 max. eng. hp 75 max. eng. hp



**UB-220** 83 max. eng. hp



U-308



UC-263 95 max. eng. hp

WITH INTERNATIONAL

# Fastest Payback Power

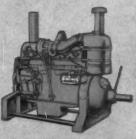




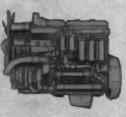
**UDT-817** 375 Int. eng. hp



UDT-1091 265 int. eng. hp



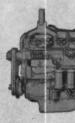
**UD-817** 240 int. eng. hp



UD-1091 216 int. eng. hp



UD-554 140 int.





U-372 110 max. eng. hp

equipment engines.

maintenance.

4's, 6's, and V-8's.



UB-264 112 max. eng. hp

starts with your

equipment engines

Your best equipment investments are dependable machines that pay for themselves fastest on the job. And by powering those machines with International you

can make sure fastest payback power starts in your

International engineers with over a half century of heavy-duty engine design experience make fastest payback power the common feature of all International engines through lowest cost operation, longworking stamina, thorough sealing, and minimum

And it's easy to match International power exactly to your machines without overpowering or underpowering. Choose from 24 models from 16.5 to 385 max. hp. Choose the desired fuel from 10 diesels and 14 natural gas, LPG or gasoline carbureted models in

All 24 models are available from stripped engines

to complete power units. A wide variety of accessory equipment including air cleaners, flywheels for lead-

ing makes of torque converters and clutches, torque converter coolers, air compressors, safety shut-offs, instruments and engine controls can be furnished for your installation requirements. Bases, radiators, hoods

and dashes, clutches and power take-offs can be

Get full details on any model from your International Power Unit Distributor or Dealer, the man who sells and services fastest payback power.



U-450 134.5 max. eng. hp



U-501 141 max. eng. hp



UV-401-170 max. eng. hp



UV-461-179 max. eng. hp



UV-549-222 max, eng. hp



U-1091—248 max. eng. hp (nat. gas)

CARBURETED

DIESEL



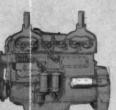
UD-236-70 int. eng. hp

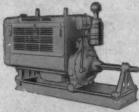
UD-554 140 int. eng. hp

UD-18A 131.5 int. eng. hp

ordered for complete power units.

UD-14A 105 int. eng. hp UD-370 95 int. eng. hp UD-282 90 int. eng. hp











## Your choice of engine sizes and fuels, all with Fastest Payback Power

p See See	WOODE	DATED DOM	CU. IN.	GASO, HP	LPG HP	NAT. GAS HP
	MODEL	RATED RPM	DISPLACEMENT		LPG NF	NAT. GAS TI
FOURS	UC-60	2500	60	16.8	10	32
	UC-135	2000	135	42	75	32 66
	UC-221	2400	221	75		
	UB-220	2400	220	83	83	70
	U-308	2400	308	92	96	82.5
SIXES	UC-263	2400	263	95	95	85
	U-372	2200	372	110	101	92.5
	UB-264		264	112	112	90
	U-450	2200	450	134.5	130.5	112
	U-501	2200	501	141	134	120
	U.V-401	2800	401	170	165	142
-EIGHTS	UV-461	2600	461	179	175	162
	UV-549	2600	549	222	215	192
aci i samuel	MODEL	man projecti a tang an ang projection				
TOURS	UD-370	2200	370	262 @ 1400	4% x 5½	95
FOURS	UD-14A	1800	460.7	325 @ 900	4¾ x 6½	105
	UD-236	2400	236	173 @ 1800	311/6 × 311/6	70
	UD-282	2400	282	217 @ 1800	311/4 x 4.39	90
	UD-554	2300	554	400 @ 1300	456 x 51/2	140
	UD-18A	1600	691.1	473 @ 850	4¾ × 6½	131.5
SIXES	UD-1091	1500	1090.6	825 @ 1150	5¾ x 7	216
	UDT-1091	1500	1090.6	1000 @ 1250	5¾ x 7	265
	UD-817	2100	817	638 @ 1600	5% x 6	240
	UDT-817	2100	817	1052 @ 1200	5% x 6	375

NOTE: For carbureted engines use 90% of max. hp shown for intermittent type application and 80% of max. hp for continuous type application.

For diesel engines use 80% of intermittent hp shown for continuous duty application.

Specifications subject to change without notice.



International Construction
Equipment

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagans... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

INTERNATIONAL HARVESTER COMPANY
180 NORTH MICHIGAN AVE. \* CHICAGO 1, ILLINOIS

## Construction News in Pictures ...





### **All Precast Concrete**

Truck crane places prestressed roof slab for a \$350,000 industrial plant at Logan, Ohio. All structural elements of the building—beams, columns, walls, and roof—are precast concrete. Marietta Concrete Co. of Marietta, Ohio, fabricated and erected the concrete components. Contractor is William Loomis & Sons.

### **Quick Switch**

plication.

Propelled orders . . . rucks . . . In just 34 hours, crews of U. S. Steel's American Bridge Division demolished a 200-ft bridge and replaced it with a new two-span bridge. They cut up the old structure in 12 hours, then lifted a 36-ft steel span into position and rolled home a 160-ft plate girder span. The bridge spans multiple railroad tracks at Bayway, N. J.

### On Schedule

Whirler crane lowers bucket of concrete into pouring position at New Cumberland Dam on the Ohio River. Dravo Corp. of Pittsburgh has poured about 60% of the concrete for the first stage of the dam despite delays caused by flooding of the cellular cofferdam last winter. The first stage of the dam is scheduled for completion this year.

continued on page 76

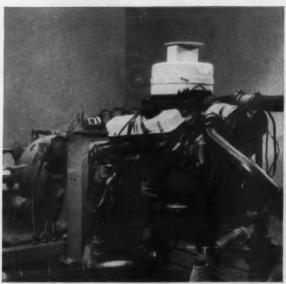


June 1959—CONSTRUCTION METHODS and Equipment—Page 73

## Here's how Champion solves the important of correctly matching spark plugs to



In a test lab at the Champion Engineering and Research Center, engineers begin the important and difficult job of matching spark plugs to a new engine. The first step is to attach the engine to a dynamometer to run tests that simulate actual driving conditions.



4. Selected plug types are thoroughly tested in the engine at various speeds, while Champion engineers carefully check for fouling, preignition, and other malfunctions. Usually, many rounds of redesigning and in-the-engine testing take place before Champion engineers are satisfied that they have come up with a spark plug type that correctly matches the engine's requirements.



5. Even after this extensive laboratory testing, Champion engineers are still not completely convinced. Limited quantities of the selected plug types are produced and distributed to commercial fleets for actual on-the-job testing. Only after thorough road testing proves that they correctly match an engine's requirements are Champion spark plug types recommended for use in the engine!

CHAMPION SPARK PLUG COMPANY

## problem engines

No matter what makes of engines you use, or how you use them—there are Champion spark plug types designed to meet their requirements! Here's how Champion engineers do it—



Champion engineers run a series of tests using spark plugs containing tiny thermometers. These thermometers, or thermocouples, are two fine wires about the size of human hair which accurately measure the temperatures of the spark plugs while the engine is operating! Champion's extensive development of thermocouple spark plugs, and superior "know how" in their use, is one reason why Champion more precisely matches spark plug types to engines than any other manufacturer.



From results of thermocouple tests, Champion engineers determine the engine's spark plug temperature requirements for top performance. They then select or design spark plug types to meet these requirements. Spark plugs must run hot enough in the engine at low speeds to burn away carbon deposits, but cool enough at high speeds to guard against preignition and excessive electrode wear.

Champions give you better ignition performance and longer spark plug life because Champions are designed to meet the requirements of specific engines.

If you aren't sure which Champion plug types are best suited to your local operating conditions, call a Champion representative. He'll help you select the Champion spark plug types that are correctly matched to the requirements of every engine in your fleet. (Champion designs spark plug types for every make of truck and car!)

Use this free Champion service to improve ignition performance and cut down spark plug replacement costs. Call your Champion representative or supplier, or write Champion at Toledo 1, Ohio.

18 OF 21 TRUCK MAKERS INSTALL



TOLEDO 1, OHIO

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#### **Good Production**

Paving goes fast at Malton Airport near Toronto where Huron Construction Co. of Chatham, Ont., is completing aircraft taxi and parking areas. One of the contractor's 34E Blaw-Knox pavers is placing nearly 1,000 cu yd of concrete a day in a 12-in.-thick 20-ft-wide pass. Trucks carry 1.3-cuyd batches to the pavers from a job site batch plant.



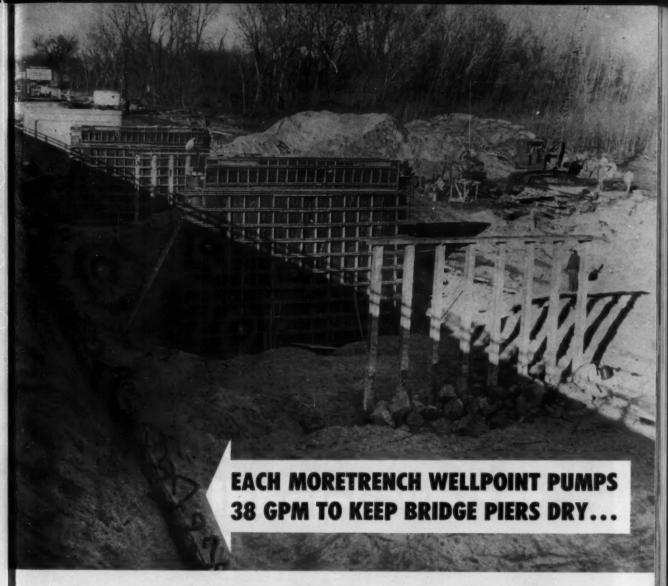
## **Plenty of Work**

Manitowoc crane sets form in the concrete spillway of Oxbow Dam on the Snake River in Idaho. The rock-fill dam will be 205 ft high and 1,150 ft long. Construction involves 2,210,000 cu yd of excavation, 1,260,000 cu yd of embankment, and 154,000 cu yd of concrete. The general contractor is Morrison-Knudsen Co., Inc.



#### **Heated Ball Park**

Candlestick Park, new home of the San Francisco Giants, will be the only heated baseball stadium in the world. Hot water circulating through wrought iron pipes under the precast concrete seats will keep fans in the reserved seat section comfortably warm on even the chilliest nights. Charles Harney, Inc., of San Francisco is the contractor.



Platte River Bridge, Platte, Nebraska - Contractor: Jensen Construction Co., Des Moines, Iowa

Deep foundations for three bridge piers are kept dry — at one time — by MORETRENCH WELLPOINT EQUIPMENT's steady removal of 16' of water from a coarse sand and pea gravel overlying medium to fine sand. Water level in river 959. Subgrade 943.

This is how experienced contractors get and keep a wet job going — at a profit — IN THE DRY!

For a realistic estimate on predraining your wet work, call our nearest office.

## MORETRENCH

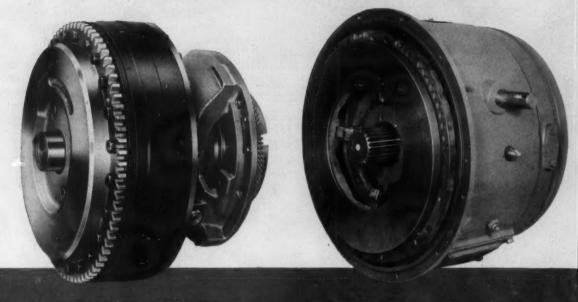
Corporation

389 Main Street Hackensack, N. J. HUbbard 9-7676 New York Tel.: CO 7-2283 4900 S. Austin Ave. Chicago 38, Illinois POrtsmouth 7-4212 7701 Interbay Blvd. Tampa 9, Florida TAmpa 61-1881 315 W. 25th St. Houston 8, Texas UNderwood 4-7774 Rockaway New Jersey OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro

Twin Disc Single-Stage Torque Converter

Twin Disc Three-Stage Torque Converter



# The drive that's best for push-loading is best for <u>any</u> job . . .

You're probably familiar with the way torque converter drives smooth out the shocks and speed up the work cycles on push-loading operations. Equally impressive is the torque converter's performance on other heavyduty crawler jobs.

"Fluid flexibility" is the key to torque converter superiority. In a mechanical drive there's no "give" under the impact of shock loads . . . every moving part is caught in the unyielding grip of steel against steel. A torque converter drive, on the other hand, is actuated by fluid which soaks

up shocks and vibrations before they can reach moving parts. As a result, engines and equipment last longer with far less maintenance.

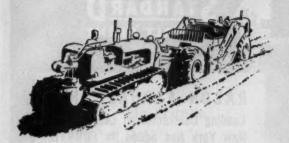
But that's not all. Torque converters have the unique ability to multiply torque whenever extra power is needed. The ratio between torque output and input is increased instantly and automatically (up to 6:1 in Twin Disc Three-Stage Converters; 3:1 in Single-Stage units) to overcome load resistance quickly and smoothly. Lugging and stalling are eliminated without increasing engine rpm. Since

the converter matches power to load demands automatically, there's no need for clutching or shifting . . . a tremendous advantage in terms of operator efficiency and productivity.

Torque converter drives are standard on Allis-Chalmers and optional on Caterpillar and International Harvester track-type tractors. All three standardize on Twin Disc components when torque converter drive is specified. For more work output and more profit... on every job... make sure your next crawler is equipped with a Twin Disc Torque Converter.

TWIN DISC CLUTCH COMPANY, RACINE,

PUSH-LOADING



PIPE LAYING



ROCK DOZING



ANGLE DOZING



TWINDISC

TWIN DISC

RIPPING

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WISCONSIN (Hydraulic Division) ROCKFORD, ILLINOIS



## WHY DID RASON BUY ITS FOURTH STANDARD PLANT?

#### HERE'S WHY! The STANDARD Model R-M Features:

- · Super-Lift dryer with Saw-Tooth lifters for maximum capacity.
- · Hi-Speed heavy duty mixer provides top efficiency with minimum mixing time.
- · Simplex push-button batching control reduces operator fatigue and speeds up operations.
- Model S-M low pressure air atomizing burner for peak capacity with lowest possible fuel consumption.
- High efficiency dual dust collector and positive dust seals assure dust free, clean operation,
- Complete accessibility to all working parts insures low cost
- Rugged simple clean design-no complicated gadgets to get out of order.

These are but a few of the many proven features that make this newest STANDARD Asphalt Plant another TOP producer for Rason.

## ASPHALT PLANTS

### STANDARD STEEL CORPORATION

Midwest Offices & Plant LEADER IRON WORKS Decatur 89, Illinois

. . built to do a better job!

PARTS WAREHOUSES IN LOS ANGELES AND DECATUR, ILLINOIS

## Hention Contractors! The New STANDARD

PORTABLE T. M. PLANT offers top production. A complete self-contained batch type Asphalt Plant...on wheels. One man operates! Has exclusive "SELF-LIFT" erecting device. RUGGED-ECONOMICAL-SIMPLE. Mixes up to 80 tons per hour!



ROTARY DRYERS . KILNS . COOLERS . ASPHALT PLANTS

## Construction 'Round the World . . .

#### In France

Prestressed concrete walls and a rear counterweight make up an unusual box-type anchorage 150 ft high for a bridge across the Seine River at Tancarville. Anchorages have battered front faces making them 154 ft long at the base and 132 ft long at the top. Over 192 tons of high tensile wire went into prestressing the concrete anchorage.

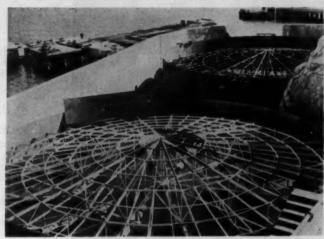


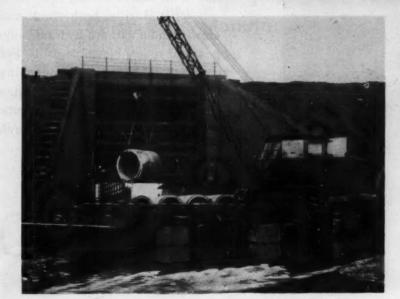
### In Australia

Because access was difficult, a Sidney contractor built a pair of cliff-side oil storage tanks by using the roofs as work platforms. They assembled each roof over empty oil drums on the bottom of the tank, then pumped in water to float it up 6 ft at a time as welders added side walls to the tank's full height.

cost

res







### In England

Crane positions 5-ft-dia reinforced concrete pipe atop a honeycomb of identical pipes to form a cellular embankment through the opening of a railroad bridge over the Wheelock River in Cheshire. Concreting the pipes together this way provides bracing for weakened bridge abutments without interrupting normal flow of river water.



#### NEWI

REICHdrill T-850 Heavy, mounted on a large, off-highway truck. This Model is designed to drill 10%" blastholes in extremely hard formations. It is turbo-charged for high altitude service.



Chicago Pneumatic has expanded its engineering and manufacturing capabilities by the acquisition of The Reich Bros. Manufacturing Company, Inc., with plants located in TERRE HAUTE, INDIANA and GLASGOW, SCOTLAND.

The acquisition of its new REICHdrill Division affords Chicago Pneumatic an unexcelled diversification in the field of drilling equipment.

REICHdrills, both truck and crawler mounted, are hydraulically-powered rotary blasthole drills. For detailed information concerning REICHdrills, or other CP Drilling Equipment, write Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.

CHICAGO PNEUMATIC
TOOL COMPANY

## NOUNCES

TO THE
CONSTRUCTION INDUSTRY
ITS NEWEST MANUFACTURING AND
SALES FACILITY:

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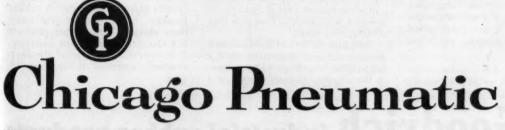
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DIVISION: CHICAGO PNEUMATIC TOOL CO., NEW YORK

Formerly:

Reich Bros. Manufacturing Company, Inc.



HYDRAULIC TOOLS . ROCK DRILLS . DIESEL ENGINES . AIR COMPRESSORS . PNEUMATIC TOOLS . VACUUM PUMPS . AIR BLAST BITS



## Men blow up rocks to make room for a dam

B.F. Goodrich improvements in rubber brought extra savings

Problem: Those machines bore deep holes in solid rock with power from compressed air. Dynamite put in the holes will blow the rock to bits. It used to be that the rubber air hose on these machines would go to pieces, too. When heat from the compressor got into the hose, it would harden the rubber, breaking it into loose pieces that clogged the machine, put it out of action.

What was done: B.F.Goodrich engineers went to work on the problem. By

adding, subtracting, changing proportions of rubber, they found a special compound for the hose that stands heat without scorching or hardening.

Savings: Hose lined with this new rubber was made and put to work. On jobs where air hose used to go to pieces in weeks, B.F.Goodrich hose now lasts months, even years.

Thousands of feet of B.F.Goodrich air hose are in constant use on the \$98,000,000 Priest Rapids Dam project in Washington (pictured above). It's doing dozens of different jobs, and lasting longer doing them, even though it's dragged over rough, jagged rocks, soaked in water, sometimes battered by flying pieces of rock.

Where to buy: Your B.F.Goodrich distributor has complete information on B.F.Goodrich air hose. And, as a factory-trained specialist in rubber products, he can answer your questions about all the rubber products B.F.Goodrich makes for industry. B.F.Goodrich Industrial Products Company, Department M-600, Akron 18, Ohio.

## B.F.Goodrich industrial rubber products

## Construction Methods AND ROUIPMENT

JUNE. 1959

VOLUME 41 . NUMBER 6

HENRY T. PEREZ, Editor

## Roadbuilding Roadblock

IN THE SPRING OF 1958 Congress passed an emergency "anti-recession" bill that provided sharply increased federal aid for interstate highway construction. Now, little more than a year later, legislators in that Washington wonderland seem unwilling to follow through with even their earlier, less accelerated roadbuilding plan. Indeed, they seem in a fair way to sit idly by and let it bog down completely.

Reason? Not that the members of Congress are in disagreement over an up-to-date highway system's importance to the nation's defense. Not that they dispute the huge savings that modern roads produce in decreased transportation costs and lower accident rates. Not that they are unaware of highway construction's vital spot in the country's economy.

All these facts the members of Congress concede. But they disagree over how to provide the money to continue to translate what is admittedly a sensible highway plan into practical reality.

The Administration favors financing the interstate system by a 1½-cent increase in the federal gasoline tax. Certain members of Congress prefer to re-allocate existing highway-user taxes. Others would resort to bond financing or treasury borrowing.

Granted, Congress has a difficult choice. But some sensible decision for providing highway funds must be made.

Unless additional funds are forthcoming from this session of Congress, roadbuilding in fiscal 1961 and beyond must be drastically curtailed.

Money for 1961 for the interstate system would, under normal circumstances, be allocated to the states this summer. Any delay would disrupt the orderly highway program now under way. It would not be long before Congress would find itself forced to initiate new "emergency" hit-or-miss highway plans with their attendant waste and inefficiency.

And look what highway construction does for the country's economy. According to the American Road Builders' Association, each \$1 billion spent on highway construction generates 102 million manhours of work on the job site and 126 million off it. At an average \$2.23 per hour, this would represent a loss of more than \$2.5 billion in wages if 1961 and 1962 interstate roadbuilding is to be restricted to the money currently available from the Highway Trust Fund.

ARBA also estimates that \$1 billion expended for roadbuilding eventually results in business transactions totaling over \$3 billion. Most of this goes for equipment (18%) and transportation (17%). But wholesale and retail trade account for 12%, cement 9%, aggregates 8%, steel 8%, insurance and taxes 6%, and petroleum products 4%.

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Figure for yourself what a cutback in highway construction funds would mean to you. Even if you're not a roadbuilder, you have a tremendous stake in the highway program. Everyone has. And the roads will be built, eventually anyway. If the program is delayed, they will just cost more. Only by keeping the program on schedule can we get the most for our highway dollars.

The time for Congress to act on highway financing is now. And now is the time for each of us to tell his Congressmen so.



ASSEMBLY—Workmen bolt gussef plates to truss to complete assembly. Trusses arrive at job site in three sections.



PICK-UP—Two cranes, stationed side by side but on opposite sides of truss, lift section into air and turn it 90 deg into erection position.

## **Cantilever Spans for Hangar**

Two skilled crane operators erect 20 steel truss sections 138 ft long in just five days, even though the erection sequence requires complex maneuvering.

A PAIR of truck cranes work with the sure dexterity of a crooked gambler to erect 138-ft-long trusses for the roof of a hangar at the Municipal Airport in Atlanta, Ga.

They pick up the 8-ton members, swing them down the alley between the two cranes and around in a 90-deg turn, then lift them into position. It's tricky work for the crane operators, but they've made good time in putting up the long trusses.

Erwin-Newman Co., steel fabricators and erectors of Houston, Tex., is building the hangar for Delta Airlines. It will house overhaul facilities for Delta's new jet airliners.

Jutting from the anchorage bents that hold the cantilever spans are twenty 177-ft trusses. They cover an unobstructed floor area totaling 71,400 sq ft.

The 138-ft-long main sections of the cantilever trusses arrive at the job in three sections from the company's fabricating plant in Texas. Two Ford trucks with A-frames mounted on the rear handle assembly of the truss sections at the site.

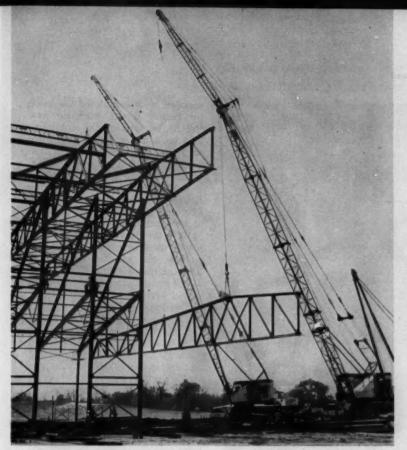
#### **Ready for Erection**

After assembly, the trusses are laid out in groups of three or four parallel to the line of main columns in the anchorage bents. Their ground placement pattern allows maximum maneuvering room for cranes and men as they work along the column line, erecting the cantilevers. But it produces an intricate handling problem for the cranes to get the trusses into raising position. They have to be turned 90 deg before they can be lifted into place.

Erwin-Newman rented two P&H 35-ton truck cranes from Superior Rigging & Erecting Co., Atlanta. One crane carries a 95-ft boom with a 30-ft jib. The other works with an 85-ft boom and a 30-ft jib.

Positioned almost side by side, but on opposite sides of the truss section, the two cranes snatch the truss about 7 ft into the air, snake it along the narrow 30-ft-wide aisle between them turning it at the same time a quarter-circle, then raise it about 50 ft to tieing position.

The crane on the farther side of the truss from the main column line holds the outer end of the truss. It walks forward with the truss as the other crane booms down. The walking crane swings its boom so that the column end of the truss edges toward the other crane. It continues moving the truss forward until the end clears the other crane. Then both cranes swing the truss around the rest of the quarter circle.



ERECTION—After snaking 138-ft-long truss down narrow aisle between them and turning it a quarter-circle, cranes lift truss 50 ft into tieing position at main columns.

After the truss passes between the cranes, a truck with A-frame grabs the end opposite the main columns and helps work the truss out and into lift position.

With the truss perpendicular to the main column line, the rest of the erection is simple. Both cranes pick up the 8-ton truss with their main falls, lift it about 50 ft, and hold it while riggers tie the truss into the main column with hightensile bolts.

#### Tie Beams

As soon as the column connection is complete, the crane on that end cuts loose and drops its hook for the tie beam that suspends the cantilever from the top of the main columns. The tie beams are 110-ft-long 14WF30 sections beefed up with 15-in. channels on top of the flange. They connect to each truss about 30 ft from the outer end.

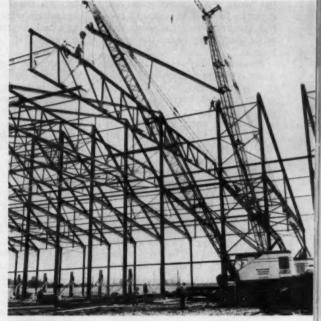
While the column-side crane hooks onto the tie beam, a pair of riggers travel across the truss and get into position to bolt the lower end of the tie beam.

The crane lifts the 5-ton tie beam about 90 ft into the air with its jib hook. Riggers on the truss align the bolt holes on the lower end and drive high-tensile bolts with a Chicago-Pneumatic impact wrench that reaches them strapped

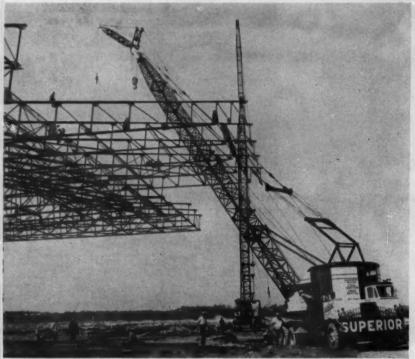
## Go Up in a Jiffy



TIE-BEAM—While the crane at the outer end holds the truss in position, the other crane drops its jib hook to pick up tie-beam.



CONNECTING—Riggers on truss drive high-tensile bolts connecting tie-beam to truss with wrench that arrives strapped to beam.



PLACING TIPS—Two cranes work from center of hangar toward each end placing 2-ton tips that extend the main cantilever trusses 40 ft to their full length of 177 ft.

to the end of the tie beam. Then riggers on the main column tie the other end in.

During bolting of the tie beam, the crane on the outer end holds the truss with boom hook and drops its jib hook to pick up a bottom strut and two bar joists that cross the bay to brace the cantilevers.

As soon as the weight of the tie beam is off the column-side crane, it cuts loose and, with jib hook, brings up two horizontal braces and two bar joists.

When the erection crew completes a bay, they move on to the next; a pair of follow-up men completes the bolting.

The Erwin-Newman crew completed the 20 cantilever bays in just five working days. They did even better with the tips that extend the truss sections to their full length. All twenty 40-ft-long tips (they weigh two tons) went up in one day. The two cranes started at the middle of the structure and worked in opposite directions toward each end.

Such long cantilever arms need plenty of anchorage. This structure has it. McKinney Drilling Co., Atlanta, drilled 30-in.-dia caissons down to bedrock, an average depth of 40 ft, to anchor the columns in each bent.

Bell bottoms averaging 5 ft in diameter increased the anchorage strength. On several column footings where water prevented drilling a bell into the rock, McKinney poured a 12-ft bell on top of bedrock.

With the footings completed, McKinney pulled the steel casings lining the holes, and the steelmen took over. Erection of the steel framework for the anchorage bents was duck soup compared to hanging the big trusses, says Erwin - Newman superintendent Paul Norwood.

#### Bent Erection

A single 35-ton P&H crane set the steel for the anchorage bents. These 80-ft-wide bents are shaped like a lean-to with two columns forming the sides and a sloping back-tie on top forming the roof. Bent spacing is 20 ft.

The crane first placed a 34-ft back column consisting of a 12WF58. Next it placed the 88-ft main column—a 14WF87 section. After adding a 24WF100 jack rafter to brace the columns, the

erection crew completed the bent by tieing in the back-tie between the tops of the columns. The back-tie is a 14WF30 with an 18-in. channel on top of the flange. This 98-ft tension member takes a 438,000-lb load.

Working one bay at a time, the Erwin-Newman crew averaged five bays per day on the erection of the anchorage bents.

With the steel framework complete, the crew placed 20-gage steel decking on the roof, assembled the metal siding at each end of the hangar, and hung the massive doors that enclose the front of the structure.

The final structure will leave the tie-beams exposed over both the anchorage bents and the cantilever trusses. Under the anchorage bents, a two-story concrete building of precast tilt-up slabs will start at the main column line and extend 40 ft past the back columns. This building will serve as a shop.

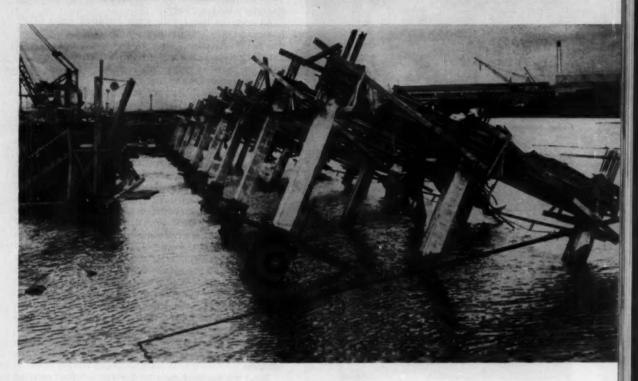
Erwin-Newman's \$800,000 contract calls for design, fabrication, and erection of the steel. Prime contractors are a joint venture of McDonough Construction Co., Atlanta, and Parr-Cox Co., San Francisco.



FOUNDATION—Rigs drill 30-in. caissons to bedrock for anchorage column footings.

Two big concrete pontoons for a floating bridge sank during the night. Workers next morning found one of them completely underwater, the other resting on the bottom with only the columns of the roadway superstructure showing. Raising and repairing the pontoons was complex, costly.

## Salvagers Raise Sunken Pontoons



IT WAS A SHOCK. Workmen arriving at the job site near Seattle that morning found two huge concrete pontoons, which they had spent six weeks casting for the Hood Canal floating bridge, on the bottom of the waterway.

No one saw the big boxes go. They sank during the night. Cause of the mysterious sinking is still unknown.

But the pontoons no longer lie in their watery resting place. In the last five months a well-planned salvage operation has raised them. Cost of salvaging them ran to \$750,000, about 75% of their value.

The two 50x360-ft pontoons 14 ft deep—built as links in a floating bridge—were tied up side by side at a wharf alongside the graving dock on the Duwamish Waterway in Seattle where they were cast. The contractor was erecting on top of the pontoons the steel and concrete superstructure that will support the roadway.

The half-completed columns of the inshore pontoon stuck out of the water, tilted away from the wharf at an angle of 22 degrees. The other pontoon was completely underwater. The 32-ft-high columns supporting the completed roadway of this offshore pontoon sheared off near their bases when the pontoon sank, and the three 350-ton roadway sections slid to the bottom between the sunken pontoons.

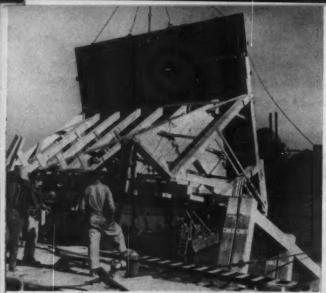
Evidently the Washington State Toll Bridge Authority feels the design is not at fault. They are going ahead with the construction of the bridge as planned. The salvaged pontoons will be repaired and used in the bridge

A recent sinking spell of a third pontoon gives a clue to the cause of the accident. Wood blocks plugging holes at one end of this pontoon worked loose and allowed water to flow into the internal compartments. The holes are near the waterline. They will hold anchor lines that string the pontoons together into a floating bridge. Fortunately workmen noticed the gradual listing of the pontoon in time to prevent another sinking.

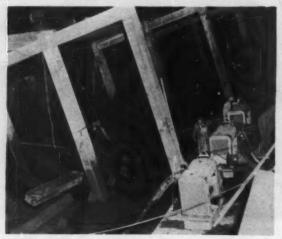
The two sunken pontoons effectively blocked the entrance to the graving dock where the remaining pontoons will be cast. The contractor had no choice but to raise the pontoons to clear the waterway.

Morrison-Knudsen Co., Boise, Idaho, heads the four-firm combine on the \$14-million bridge project. Others in the joint venture are Puget Sound Bridge and Dredging Co., and General Construction Co., both of Seattle, and Henry J. Kaiser Co., Oakland, Calif. The combine called in salvage expert Fred Devine of Portland, Ore., to supervise the salvage operation.

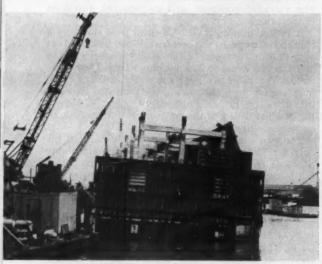
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COFFERDAM—Floating crane places steel form panels bolted to timber framework along sides of pontoon to make a cofferdam.



PUMPS—Fifteen pumps mounted on floats above inshore portion of pontoon operate all night long to pump out 800,000 gal of water.



FLOATING AGAIN—Still listing slightly, pontoon rises above water the next morning. Cables hold inshore side and prevent capsizing.

#### SUNKEN PONTOONS ... continued

## Raising First Pontoon Forms Make a Cofferdam

Steel panels used as forms in casting the walls of the pontoons played a big role in salvaging the sunken inshore pontoon. With them the contractor built a cofferdam around the sides of the pontoon deck. Then pumps dewatered the cofferdam-enclosed box to restore its buoyancy.

As soon as the forms were stripped from other pontoons being cast in the graving dock, crews bolted the 5x15¾-ft panels to a 40-ft-wide framework of 12x12 timbers. Each cofferdam section consisted of 16 form panels, fastened together in two rows through angles bolted back to back. This made a 31½-ft-high wall. Rubber seals made the joints at the end of the 40-ft sections and between top and bottom panels watertight.

Each panel consists of a 3/16-in. steel skin plate braced by vertical 3-in. channels spaced at 1-ft. 3-in. centers. The top waler is a single 4-in. channel. The other three walers consist of two channels—one 5-in. and one 6-in.—spaced at 4½-ft centers. Dixie Form & Steel Co. manufactured the panels.

The timber framework supporting the cofferdam was installed on the pontoon at an angle of 22 deg to the deck so that the cofferdam extended vertically upward in the water. This reduced the uplift on the wall and limited the area to be dewatered.

The 31½-ft-high wall was needed only on the low side of the pontoon. One lift of steel panels was sufficient at the ends of the pontoon, except at the outer corners. A 30-in.-high timber wall was all that was needed along the inshore side.

A 40-ton Washington whirler crane moved the 22-ton cofferdam sections to the edge of the graving dock in which they had been assembled. From there a 75-ton floating crane handled installation of the sections.

Steel scrap tied to the bottom of the sections weighted them and held them to the deck of the sunken pontoon. In addition, eight 1-in. cables strung from the top of the sections to the deck held them vertical and prevented them from rotating upward. After erecting the sections and bolting them together, workmen pumped grout into the joint at the base of the wall where it met the pontoon deck.

The vertical 12x12's to which the steel form panels are attached rested on the outer edge of the pontoon, extending outward slightly. The lower edge of each panel extended about 1 ft below the edge of the deck. Steel rods at the base of the supporting framework held the sections tightly in place.

Placing of the cofferdam proceeded at the rate of one section per day. Six divers, working virtually around the clock, directed the work.

Twelve 6 to 10-in. gasoline pumps and three 6-in. electric pumps, with a combined capacity in excess of 40,000 gpm, installed on floats above the inshore portion of the pontoon pumped out the 800,000 gal of water necessary to float the submerged concrete box.

Starting at low tide around 6 pm, the pumps operated all night raising the pontoon gradually to the surface. Some of the suction lines were laid on the submerged deck of the pontoon. Others extended into the hatches.

To prevent the pontoon from righting itself too

quickly and submerging the low inshore side of the cofferdam, cables running from the inshore side to the floating crane, a 10-ton hoist, and a 35-ton Skagit hoist stabilized the pontoon. Air remaining in the 27 inshore cells was bled off before pumping started.

Two concrete bulkheads had been built across the width of the pontoon in case one end should rise more rapidly than the other, but they proved un-

necessary

After the pontoon was pumped dry, it was towed out into the channel, turned around so that the high side of the cofferdam was facing the shore, and brought back alongside the wharf. Then the floating crane dismantled the steel plates and timber framework forming the cofferdam. Two newly completed pontoons were floated out of the graving dock, and the steel panels returned to the yard to serve as forms for the next pair of pontoons to be cast.

## Raising Second Pontoon Winches Haul It Up

Raising the second pontoon was less spectacular. Twenty-four 100-ton winches mounted on two 48x-150-ft barges lifted the sunken box from the bottom of the waterway.

Total submerged weight of the pontoon was 2,300 tons. Compressed air from three Ingersoll-Rand compressors pumped into the cells displaced some of the water and reduced the weight to 800 tons. All but 15 of the 96 cells in the pontoon could still hold air.

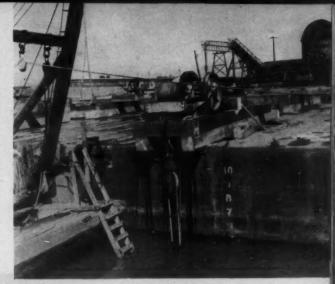
The amount of air and water in the cells was carefully controlled to prevent the possibility of positive buoyancy and almost certain damage to the pontoon. Engineers computed that the top slab of the pontoon could withstand an upward pressure of 3 psi. Had sufficient air been introduced to provide positive buoyancy and a rapid rise to the surface, an elaborate venting system would have been required to bleed off the expanding air in a matter of seconds to keep the pressure below the critical 3-psi limit.

Curves showing the depth of air required to maintain an 800-ton negative buoyancy at low tide and a 300-ton negative buoyancy with the top deck at water surface were plotted for various tide levels between high and low. By comparing the curves to a visible tide gage, the diver tender could inform the compressor operator of the correct depth of air pressure to maintain at any given height of water surface.

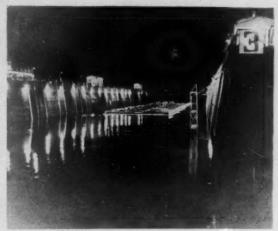
Cables of 1¼-in. dia were jetted beneath the pontoon from a winch on one side of the barge to another winch at the other side. This cable pulled a 2-in. cable along the same route. Both cables were used in the lifting operation. The 2-in. line extended between the blocks on either side of the pontoon, with the 1¼-in. line from the winch supporting the first block and then moving through a second block and beneath the pontoon to two similar blocks on the other side. This setup equalized the load and made possible lifting the pontoon on an even keel.

The winches lifted the pontoon off the bottom with the aid of a 15-ft tide. They raised the huge concrete box at the rate of 4 in. per hour until the total draft to the bottom of the waterway was 25 ft.

Four tugs then towed the barges and the still-submerged pontoon downstream to a floating drydock. The barges deposited the pontoon on the floor of the



LIFTING-Twenty-four 100-ton winches mounted on a barge raise the pontoon 4-in. per hour. Cables jetted under box pull it up.



**DEWATERING**—In floating drydock, submerged pontoon is raised until deck is exposed. Then pumps dewater flooded compartments.



BATTERED BUT BUOYANT—Tug tows pontoon to anchorage upstream where it will await repair and erection of roadway structure.

#### SUNKEN PONTOONS ... continued

drydock, which was then dewatered until the deck of the pontoon showed above water. Next, twelve 4-in. pumps—one at each hatch—pumped out the water in the pontoon. Then it was towed to an anchorage upstream to await repair and erection of a new superstructure.

Barge-mounted winches also raised the three sections of roadway slab that sheared off from the supporting columns of the offshore pontoon and settled on the bottom between the sunken boxes. Twenty 100-ton winches mounted on a 40x140-ft barge pro-

vided the lifting muscle. Two men operated each winch by hand. A 1%-in. cable extended beneath the roadway slab to winches at either side of the barge.

The winches raised each 350-ton section to about 5 ft below the bottom of the barge. Then, with the sheared-off columns dangling beneath, the barge towed two of the sections about four miles down the waterway to Seattle Harbor, where they were dumped in deep water. The steel forms for the roadway slab—worth about \$100,000—were still in place. The third section was grounded for inspection.

### Cast Two Pontoons at a Time



GRAVING DOCK—Extended for this job, the graving dock measures 400x123x22 ft, handles casting of two pontoons at a time. Re-

valving crane on top of gantry tower places forms, handles concrete. Before accident, production was two pontoons every six weeks.

Now casting of the 12 remaining pontoons for the bridge is under way at full speed. The first 11 pontoons had been cast at a rate of two every six weeks. Maintenance of this rate is now essential if the project is to be completed on schedule.

The pontoons vary in size, but a typical box measures 50x360 ft. They are all 14 ft deep. Cells divide the interior of the pontoons into 15x12½-ft compartments, laid out in four rows across the width and up to 24 along the length. Bottom slab and exterior walls are 9 in. thick; deck slab is 7 in. thick.

The graving dock on the Duwamish Waterway where the combine is casting the pontoons was built before World War II, but it has been extended by 14 ft for this job so that two pontoons can be cast at a time. The graving dock measures 400x123x22 ft.

The 40-ton whirler crane and a Northwestern 95 crawler crane team up to set and strip forms and to place the concrete.

The same 5x15%-ft steel panels used to build the cofferdam for the salvage operation serve as forms for the outside walls of the pontoons. Strongbacks

consisting of 6-in, channels spaced at 10 ft support the panels. Timber braces align the panels during erection, but they are no longer needed when the panels have been tied to the pontoon cell forms on the inside of the box.

A ratchet jack pulls in a stripping key at each corner of the cells to release them after the concrete is set. The contractor expects 14 or 15 reuses for each of the pontoon cell forms.

Collapsible grids made of strips of Sitka spruce support the timber deck forms on top of the pontoon cells. Workmen strip them by collapsing them and pulling them through the 2x4-ft openings in the deck.

A Noble batch plant, equipped with two 2-yd tilting mixers, supplies concrete. Trucks carry one 2-yd Blaw-Knox concrete bucket from the batch plant to the dock at a time. Cranes pick up the loaded buckets and dump them into a 4-yd hopper on one of two bridges that cross the graving dock. Powered by 5-ton Beebe hoists at each end, the bridges run on rails alongside the dock.



OUTSIDE WALLS—Temporary timber rakers align 5x15¾-ft steel panels. Strongbacks spaced at 10-ft centers brace the wall panels.



INTERIOR CELLS—Prefab cells form 121/2x15-ft compartments that honeycomb interior of pontoons. Typical 50x360-ft box has 96 cells.



CONCRETING—Truck brings 2-yd concrete bucket from nearby Noble batch plant to graving dock. Cranes dump buckets into 4-yd

hopper on one of two bridges that span dock. Push-type buggies deliver mix to elephant-truck tremies that chute it into forms.

Push-type %-yd buggies carry the concrete from the hoppers to the pour area. The job demands many small batches of concrete rather than large mass pours. Elephant-trunk tremies chute the concrete into the thin wall sections.

#### **Two-Phase Concreting**

Concrete is poured in two phases. The first bridge handles the first phase, completing the bottom slab and bringing concrete up about 3 ft in the walls. After a 2-hr layoff to allow the concrete to settle, the second bridge takes over and completes the pour.

Since the concrete must be monolithic, pours are continuous. They often last well into the night. Ordinarily two 12-hr shifts are employed.

After concreting, each pontoon is prestressed with 43 cables that run through the bottom slab and the longitudinal walls. A stiff wire attached to the %-in. prestressing strands with a Kellems grip pulls the wires through the 1½-in. flexible metal tubing set in the concrete to house the cables. Then 100-ton jacks post-tension the cables.

Besides the pontoons, the job involves casting 42 concrete anchors that will hold the pontoons in place in the floating bridge. Each anchor is a 19x40x15-ft box that when filled with concrete will weigh 900 tons. Wall thickness ranges from 6 to 12 in.

The bridge will carry a two-lane highway across Hood Canal, an 8,300-ft-wide arm of Puget Sound. The canal is more than 150-ft deep along its 4,600-ft channel, and reaches a maximum depth of 340 ft. That's why Washington State Toll Bridge Authority engineers chose a floating structure rather than one supported on piers.

The floating section of the bridge is 6,470 ft long. In the center of the channel, pontoons will retract to clear a 600-ft opening for the passage of large vessels. At each end of the pontoons, a 280-ft steel truss span will link the floating portion of the bridge to the pier-supported approach spans. Total length of the bridge will be 7,886 ft.

Project manager in charge for the four-firm combine is Tom Moyer. Glenn Toy is project engineer, and Darwin Lind is general superintendent.

## **Precast Shapes Frame Building**

Forming hyperbolic paraboloid panels looks difficult, but this contractor casts them so accurately that they fit together like precision-fabricated steel.

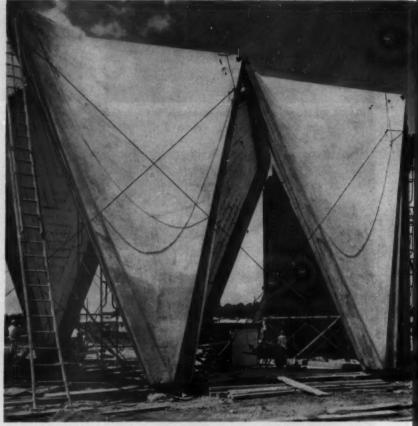
HYPERBOLIC PARABOLOID structures are not the easiest type of concrete buildings to form. But more contractors are learning how to do it all the time, as the hyperbolic paraboloid becomes more popular. They are finding it's not as hard as it looks. But it does require careful planning and sound concrete practice.

C. G. Schmidt, Inc., of Milwaukee are established members of the club of contractors who know how to build hyperbolic paraboloid structures. They've just finished a \$110,000 contract to build the Zion Evangelical and Reformed Church in Milwaukee. They did such a good job of forming the complex shapes required for this building that the parts fit together like precision-fabricated structural steel. Their handling of the job drew plaudits from W. P. Wenzler, the architect who designed the building.

#### Six Wall Panels

The main part of the church consists of six 20x30-ft paraboloids of shell concrete that form the side walls, plus four 20x30-ft ceiling units. The large triangular spaces between the side panels are filled with glass set in concrete structural mullions. Front and back walls of the 42x 80-ft church are of masonry with stone veneer. The church is 33 ft high at the peak.

The four-sided panels consist of edge beams 12 in. thick and 15-24 in. wide. The center shell is only 3 in. thick. The edge beams of the side panels curve to a depth of 9½ ft. Roof panels curve to a depth of 6 ft. But in spite of the complex curvature of the panels, all surfaces can be formed by a



PANELS IN PLACE—The six hyperbolic paraboloid panels fit together like this to form the basic structure of a church. Accurate forming resulted in a perfect fit.

series of straight lines. This helped considerably in setting up the forms.

Schmidt decided to precast the side panels so they could pour them in a flat position without forms for the outside surface. But they planned to pour the roof panels in place to eliminate any possible fitting problems.

They poured the concrete floor slab first to get a firm base on which to construct the forms for the side panels. Then they built two identical forms for the wall panels. With two forms they could be working on one while the other was curing and alternate back and forth to keep the crews

Schmidt built a framework of 4x4 and 6x6-in, timbers to carry

the formwork. The edge beams were formed of plywood. Straight 1-in. boards formed the central shell. A 1½-in. layer of Styrofoam, placed in the forms, fused with the concrete to become a permanent insulating lining of the panel and serve as a base to hold the plaster. It also eliminated the problem of board marks on the inside of the panel and made it easier to strip the panel from the forms.

#### **Light Reinforcing**

No special admixtures went into the concrete. Design strength was only 3,750 psi. The structural strength of the paraboloid comes from the shape; only light wire mesh reinforcement was required.



POURING THE CONCRETE.—Crews pour concrete into one of the panel torms. Contractor built two forms; while one panel was curing, the concrete crew worked on the other.

To obtain the proper curve for the top surface of the panel, Schmidt fixed curved screeding strips in place across the forms at regular intervals. They poured the concrete and shaped it flush with the tops of the screeding strips. Then, before the concrete set, they removed the strips and filled in the space they had occupied with fresh concrete, smoothing it to match the area already shaped.

#### **Curing Concrete**

Curing followed the standard procedure; the concrete remained under wet burlap for 10-14 days. The entire production cycle for one panel was 2-3 weeks. Curing took the most time; pouring took the least—one day. The rest of the time was needed to rebuild the forms after the panel was removed.

continued on next page



SCREEDING THE PANEL—Men shape top surface of panel using curved screed strips as guide. When strips are removed, another man fills in and smooths over the hole.

#### PRECAST SHAPES FRAME BUILDING continued

## Crews Erect Two Panels At a Time

Schmidt designed the forms so that they could be reused with as little rebuilding as possible. But it was necessary to remove the side plywood forms to release the panel, and these had to be replaced for the next pour. The planks under the center shell remained more or less intact and required little rebuilding.

The architect had designated lifting hooks at two corners of the panels. Schmidt modified the lifting arrangement so that he could lift it by the four corners for better control.

Schmidt also strengthened the lifting loops by replacing the original cast-in loop with a hook and bolt that extended right through the corner of the panel and was backed on the other side with a steel plate.

Schmidt's construction sequence was to build all six of the side panels before erecting any of them. They laid the first ones on piles of sand to prevent damage to them while they poured the others. It took two months to produce the six panels.

Two 60-ton cranes erected the 28-ton panels in pairs. From one side of the church, one crane picked up one panel. The second crane, on the other side of the church, picked up another panel. Together they placed the pair in position, and crews bolted them together at the top. Then they repeated the process for the remaining panels. All of them fit perfectly—the result of careful forming and pouring.

It took about one day to put a pair of panels in place. The entire erection took a week.

After the side panels were in place, Schmidt built up formwork from the floor and poured the roof panels in place. At the same time the crews grouted in the bolted joints of the side panels. The joints had been designed so they could be concreted over to leave a smooth final surface.

C. G. Schmidt, president of the firm, had overall responsibility for the job. Harvey Peterson was general superintendent, and Thomas Weinert was job superintendent. William P. Wenzler of Milwaukee was the architect.



LIFTING THE PANEL—Crane lifts panel off form. Contractor redesigned lifting points so he could lift from four corners instead of two. Result was better control of lift.



SETTING THE BASE—Crews jockey base of panel into slot in concrete floor of church. Specially formed key at base of panel is designed to fit exactly into the slot.

CONNECTING THE PEAK—Two cranes position two panels simultaneously. Man at peak waits to bolt together the top of the panels. Joint is later grouted over.

Page 96-CONSTRUCTION METHODS and Equipment-June 1959

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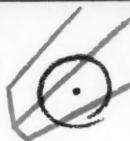
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### 8 POINT SHAPES

You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

## **ESCO** Points and Adapters for all digging equipment

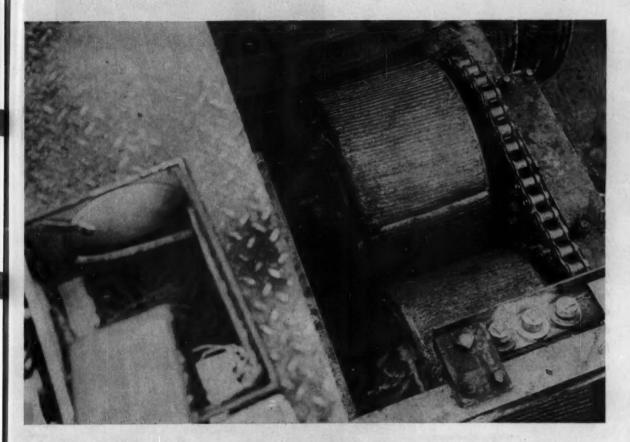
Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

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## STOODY SEMI-AUTOMATIC HARD-FACING

Near Grants, New Mexico, a new super highway is under construction. Keeping crushers in operation to supply aggregate is a tough job. Roy Hartman, the welder, states, "I like to hard-face with the Semi-Automatic machine. On crusher rolls, I can lay down from  $7\frac{1}{2}$  to 10 pounds of Stoody 100 per hour but only about half that much when applying manual electrodes—even though working hard. Semi-Automatic hard-facing makes my job easier."

To lick the toughest jobs fast, with less wear-and-tear on yourself, just try Stoody Semi-Automatic Hard-Facing. A variety of alloy types cover all hard-facing requirements. If you'd like a demonstration in your own plant on your work, simply ask your nearest Stoody Dealer (see the "Yellow Pages" of your phone book) or write direct to the company.



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Stoody Semi-Automatic wires are available in a variety of alloy types for all job requirements. They can be fed through most standard semi-automatic welding machines.

June 1959—CONSTRUCTION METHODS and Equipment—Page 99

A team of pipeline contractors assembles a pair of pipelines on the bank and pulls them 4,200 ft across the Hudson River in less than a week. Special equipment, most of it designed by one of the contractors, make the fast crossing possible.



PREPARING—Two Lima cranes lift a 160ft section of 24-in. concrete-covered pipe from rack and set it alongside twin member on a specially designed platform.

## Twin Pipelines Cross the River

ONE THING that pleases a pipeline contractor more than a neat, efficient method for pulling a pipe across a river is a neat, efficient method for pulling two pipes across at the same time.

So one highly pleased pipeline contractor is Samuel Gallucci & Sons of New York who, with the help of Collins Construction Co. of Port Lavaca, Tex., simultaneously pulled two 24-in.-dia concrete encased lines 4,200 ft

across the Hudson River between Manhattan and North Bergen, N.J.

Launching of the pipe took place on the Manhattan side of the river. Collins first set up a Seamaster, a winch of Collins' own design, on the New Jersey side. The winch had two oversized drums capable of handling 6,500 ft of 1¼-in. cable and a maximum line pull of 600,000 lb. A GM diesel powered the winch.

Collins fitted to the cable end a special dual-nose pulling yoke that would tie into the leading ends of the twin pipelines. Attached to the yoke was a 4,000-lb-lift pontoon 3 ft in dia and 5 ft high. This yoke assembly was hauled back to the Manhattan side of the river to get the launching started.

Pipe came to the launching area in 40-ft lengths, coated with 1-in. of black mastic under 2 in. of



NOSE CONE—Two flange-connected steel pulling caps fiitted with a 4,000-lb-lift pontoon are welded to leading ends of pipes.



LAUNCHING—Twin pipeline, buoyed by 12,500-lb-lift pontoons, slides into Hudson River between guide posts as faunching begins.



SPLICING—Two additional sections of pipe are welded onto leading sections. Splice will be covered with coat of concrete.



STRAPPING—Workmen wind Brainard steel strapping around pipes and pontoon to ready second section of pipeline for launching.

## at the Same Time

chicken-wire-reinforced concrete casing. At the launching site, the 40-ft lengths were welded together on pipe racks to make 160-ft lengths that each weighed 35 tons.

Welds were checked by X-ray and joints were concreted. Then a pair of Lima 55-ton cranes and a 75-ton Lima rig lifted the 160-ft length of pipe and positioned it on a specially designed launching platform.

The launching platform was another Collins innovation. It consisted of a series of simple skid-mounted steel frames. Each was fitted with two sets of three free-turning rubber-tired wheels on which the pipeline rode as it was winched forward.

First step in getting the launching under way was to weld the pulling yoke to the noses of the first pair of pipe lines. Next, the contractor placed two 12,500-lb-

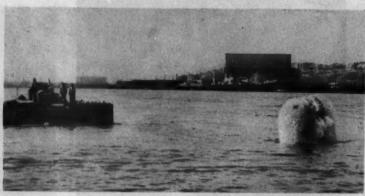
lift pontoons 5 ft in dia and 15 ft long on each end of the dual pipeline. Designed to keep the pipe slightly up from the river bottom, these were anchored to the pipe by several turns of Brainard steel strapping.

Fitted to each pontoon was a cutting device that would cut the strapping and free the pontoons once the crossing was completed. This cutting device consisted of a steel cutting bar tucked up under the strapping. A coiled length of line was attached by one end to the cutting bar handle and by the other end to a small metal buoy.

continued on next page

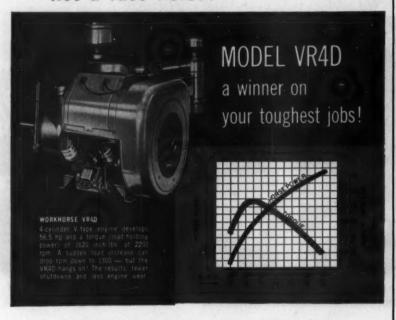
#### TWIN PIPELINES ... continued

The buoy—along with other like buoys on each pontoon—played an important role in keeping the surface of the river open to boat traffic. Each buoy was anchored to its pontoon by a line slip-knotted at one end. Free ends were joined with other similarly fastened buoys along the pipe line. These buoys rode deep with the pipeline along the river bottom. The final free end of line was held ashore to serve as a trip line.



RELEASING—Workmen aboard barge pull up on a trip line that actuates a cutting device, snapping the steel straps to release a pontoon and let the pipelines settle.

this WISCONSIN engine is a **Workhorse...** not a race horse!



Here's 56.5 hard-working horsepower you can depend on for steady power at any pace! The Model VR4D breezes through normal power demands — works effortlessly at top speed. But most important, it has rugged load-holding power at slow speeds — to keep going under sudden shock loads that would most likely stall other engines with the same piston displacement.

You don't have to pamper the Model VR4D. It's built to resist the hardest shocks on the toughest construction jobs. Air cooling cuts engine weight and upkeep—assures fast starts and top efficiency in any weather, from sub-zero to 140°F. Stellite exhaust valves and valve seat inserts and positive-type valve rotators extend valve life by 200% to 500%. They resist corrosion and pitting—give better fuel economy.

Protect yourself — specify Wisconsin-powered equipment for the tough jobs ahead. You get workhorse stamina in every Wisconsin engine—single, two, or V-type four-cylinder models, from 3 to 56 hp. Write for Form S-230 on the VR-4D — or Bulletin S-237 describing the entire Wisconsin line.

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MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

With preparatory work completed, the winch on the New Jersey side pulled the first 100 ft of the dual pipeline into the water. The cranes at the launching site then set another pair of 160-ft lengths of pipe on the launching platforms. There the rear ends of the first pipe lengths were welded to the forward ends of the second lengths of pipe.

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The contractor repeated this procedure section after section until the dual lines had made the full river crossing. Workmen then began cutting the strapping to release the pipeline and bring it to rest in a previously prepared trench.

A tug-pulled barge started out from the New Jersey side. Workmen aboard pulled on the trip line releasing the small buoys fastened to the big pontoons. These buoys popped to the surface, bringing with them the length of line fastened to the cutting bar. Workmen pulled up on these lines to raise the cutting bar handles and slice the steel strapping, thus freeing the pontoons which popped to the surface.

The twin pipeline settled into a trench 20 ft wide and 25 ft deep previously dug by Great Lakes Dredge and Dock Co. and was covered with a backfill of select sand and gravel. The job took less than a week.

Gallucci did the work under contract to Transcontinental Gas Pipe Line Corp. Heading the work for the firm was Vic Gallucci, president, Gerard P. Sherry, general superintendent, and Charles Hickey, superintendent. Collins' work was supervised by Sammy Collins, president, and Jean Johnson, superintendent.



No. 955 excavates part of a total of 19,000 yd., preparing for base an area 20 ft. wide, 12-13 in. deep. Cuts are made by Cat No. 12 Motor Grader and windrowed. Job is part of a \$1,828,366 project by Gulf Bitulithic Co. on U. S. 75, to be part of the Interstate Highway System.



Says Operator F. H. Leggett: "I can move over 100 cu. yd. a day more with the side dump than with other loaders. It doesn't spill dirt because you don't have to jockey for position. A Traxcavator is easy to operate and I'm less tired at night. It's the best on the market."



## Weather bad... No. 955 terrific...

## job on schedule!

Bad weather cut work days during the first six months to 20 per cent, but the highway project stayed on schedule. Reason: a Caterpillar No. 955 Traxcavator with Side Dump Bucket.

Gulf Bitulithic Co., Houston, Texas, first tried a drag line on a 2½-mile widening job on U.S. 75 at Conroe, Texas. Production was poor in the shallow cut. Switching to a No. 955, five-yd. trucks were loaded in an average time of three minutes; four buckets to the truck.

"We increased production 25 per cent," says Superintendent Thomas "Red" Brown. "I like that Side Dump Bucket. You can't beat it!"

In-line loading of trucks with the Side Dump Bucket paid off in less traffic congestion on the busy highway, and it also avoided tearing up the subgrade with twisting and turning.

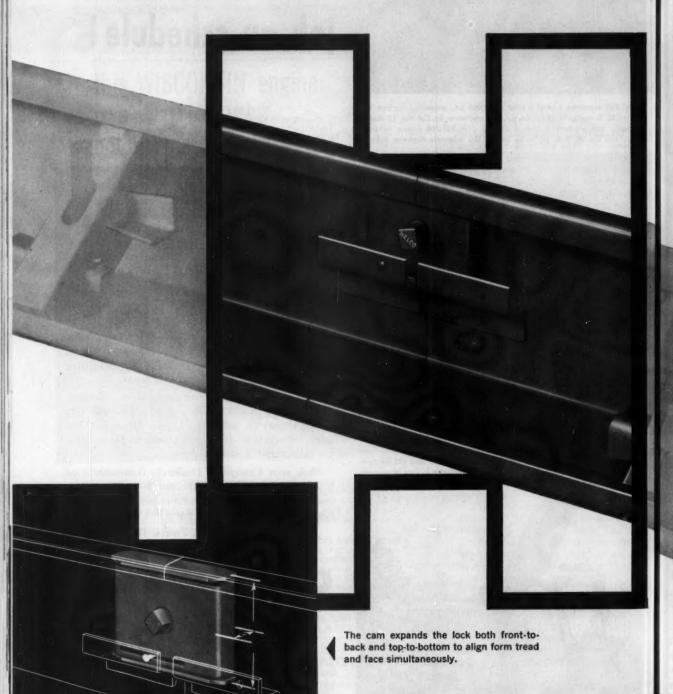
Side Dump Buckets are available on all three Traxcavators: No. 977 (2½ cu. yd.), No. 955 (1½ cu. yd.) and No. 933 (1½ cu. yd.). Other buckets, teeth, 'dozers and forks help make a Traxcavator the most versatile excavator-loader.

Ask your Caterpillar Dealer to demonstrate on your job how a Traxcavator can make money for you. He stands behind every machine he sells with round-the-clock service and parts you can trust.

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## TEEL FORMS!

From steel form headquarters—revolutionary new highway forms that go together with absolutely rigid straight-line joints ... faster, easier than ever before! They're HELTZEL'S NEW \*CAM-LOK STEEL FORMS!

Sturdily constructed on a simple cam principle, the new Cam-Lok slides easily into position. A fast quarter turn of the cam draws the treads of both form sections into alignment—with a joint that can't shake loose regardless of the vertical thrust of the machine weight or the horizontal thrust of spreader and finisher. An open end wrench is the only tool needed. There's no sledging with resulting tread and lock damage—no chance for misadjustment, and the simple cam mechanism is positively non-fouling!

There's more to these new Cam-Lok forms. Full channel stake pockets with angular wedges are stronger and insure better stake retention. They're available in the single or double wedge type with or without upturned flange base. Cam-Lok Highway Forms have a cambered base end and are available for radii forming.

AIRPORT FORMS, too, now come equipped with the fast setting, self-aligning new Cam-Lok. You'll want to know more about this great new idea in highway and airport forms. Write today for your copy of the Heltzel Cam-Lok Bulletin.

wrench is the only tool needed.

o sledging with resulting tread
damage—no chance for misadand the simple cam mechanism
by non-fouling!
more to these new Cam-Lok
ll channel stake pockets with

A fast quarter turn fully expands Cam-Lok aligning treads and holding them in alignment, until released.

Tapered leads make the Cam-Lok easy to

position. This feature also permits greater

form-to-form flexibility while setting.

\* Patent Pending



ORM AND IRON COMPANY WARREN, OHIO





## "Our Ford F-800's, pulling 20-ton payloads, give us mighty good service!"

says R. Dillard Teer, Vice President Nello L. Teer Co., Durham, N. Carolina

"We operate about 115 Ford Trucks ranging in size from ½-ton pickups to Tilt Cab Tandem tractors. We believe in carefully fitting the truck to the job to be done and usually stay within the manufacturer's recommended ratings. We make an exception to this rule with our Ford F-800's, pulling 20-ton loads in aluminum trailer dumps to our quarry and crushing setup at Durham, North Carolina. These units are carrying the maximum legal limit and give us mighty good service!

"We haven't traded any trucks in about 6 years. It just happens that our company has

been growing so rapidly that when we buy a new truck, usually an F-800, I put it under one of our trailer dumps. Then I'll take the old truck, lengthen the chassis, and make a grease outfit or a water wagon out of it. I would say out of over a hundred Ford units in the past 7 or 8 years, we have gotten rid of only a dozen altogether—and some of these were wrecked or burned.

"Another reason we use Fords is that this business is rough on trucks, so parts availability is very important. Our experience over the years with Ford as compared to Ford competitors has been definitely in favor of Ford on parts."

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NOW! CERTIFIED PROOF!

## FORD TRUCKS COST LESS

**'59 Ford Pickups** beat average mileage of other leading makes by 25.2 % in **Economy Showdown U.S.A.** 

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Here at last is certified proof of the differences in gas mileage between sixcylinder pickups . . . evidence that you

can use in your operation.

It was compiled by America's foremost independent automotive research firm after testing 1959 six-cylinder, %-

ton pickups of the six leading makes. All trucks were bought from dealersjust as you would.

The tests paralleled every kind of driving - high speeds and low, open highways and city traffic, even door-todoor delivery. And in every test, '59 Ford Sixes delivered more miles per gallon than any other make. Here are the actual percentages:

'59 FORD PICKUP SIXES GAVE

42.6% better mileage than make "D" 31.1% better mileage than make "I" 25.2% better mileage than make "C" 22.0% better mileage than make "S"

9.6% better mileage than make "G"

Taken together, Ford got 25.2% more miles per gallon than the average of all other leading pickups!

Now! During Dividend Days at your Ford Dealer's...Go FORD-ward for Savings

What's the secret of Ford's economy? First, of all pickup sixes, only the Ford Six has modern Short Stroke design which reduces friction and requires less fuel. Second, to this modern engine, Ford has added a new economy carburetor to meter fuel more precisely in both high- and low-speed ranges.

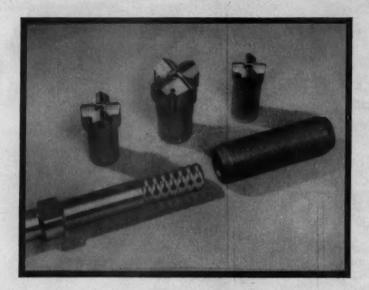
See your Ford Dealer for the full report of Economy Showdown U.S.A. and get the whole story firsthand.

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\*NAME AVAILABLE ON REQUEST and inquiry to P.O. Box 2687, Ford Divi Ford Motor Co., Detroit 31, Michigan



## Here's proof Coromant rope-thread bits and steels SAVE TIME AND MONEY

"Up to double the footage between sharpenings!"

"Premature rod breakage is almost non-existent!"

"40% more usable life-more resharpenings!"

"Bit and rod life are well above average!"

"Uncouple by hand all the time!"

"More rigid-drills straighter holes!"\*

\*Names of men quoted available on request

The comments above are actual quotes from project managers, job superintendents, and drill superintendents who have tested new Coromant rope-thread bits and steels. They've learned, on-the-job, the benefits they—and you—can expect!

For example: The new rope-thread (only two turns per inch) holds tight in use, yet permits hand uncoupling. Reports show that the time saved results in more footage drilled per shift. Bit footage is well above average too, with less loss of carbide inserts. Prime quality ore plus nickel-chrome alloy permits cold-rolling from billets for greater strength, life and rigidity. And only with Coromant rope-thread steels can you re-thread without heat treating, too. Do it yourself, or at any nearby machine shop.

Want to know more? There's no obligation on your part, but we'll be glad to help where we can. Just call your nearest Atlas Copco Office, or write to us at Dept. CM-7.

## Atlas Copco

610 Industrial Avenue Paramus, New Jersey COlfax 1-6800 930 Brittan Avenue San Carlos, California LYtell 1-0375 The contractor building the Calumet Sag Lock in Chicago handles the concrete work behind a single-wall, sheet pile cofferdam, rather than the more expensive cellular cofferdam that all other bidders for the job had figured on. Early photo of the work shows the permanent cellular lock walls in place. Dotted lines show the locations of the dam and the single walls at each end of the lock.



## **Light Cofferdam Cuts Lock Cost**

WHEN A SMART CONTRAC-TOR leaves \$800,000 on the table on a \$6-million job, he's obviously figured out a much more efficient way to do the job than any other bidder.

FitzSimons and Connell Dredge and Dock Division of Merritt-Chapman & Scott Corp. submitted a low bid of \$5.8 million to build the Calumet River Lock in Chicago. And they knew exactly what they were doing. The bid was \$800,000 below the next lowest bidder, but FitzSimons and Connell had an angle the others hadn't figured on.

They planned to do the concrete work behind a single-wall, sheet-pile cofferdam with batter pile bracing. Everyone else planned to use a more conventional—but twice as expensive—cellular, earth-filled cofferdam.

The lock is part of the \$200-million Calumet-Sag Navigation Project that will improve navigation between Lake Michigan and the Mississippi River. The Chicago District of the Corps of Engineers is in charge of the construction.

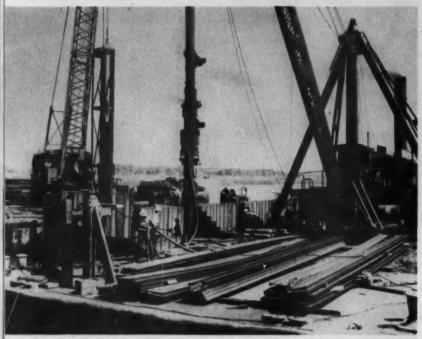
#### **Batter Piles in Tension**

FitzSimons and Connell have had a lot of experience with single sheet piling structures. It's a common technique for dock construction in Chicago. But with a dock, the earth fill and the batter piles are on the same side of the sheet piling, so the batter piles are in tension. When the same structure is used as a cofferdam, there is no fill so the batter piles must withstand a compressive force.

This meant designing batter piles to act as struts and also installing a connection between the batter piles and sheet piles capable of withstanding a compressive load without buckling.

A single-wall cofferdam often is not a good bet. But on the Calumet-Sag job, conditions were just right. And FitzSimons and Connell were smart enough to realize it.

To start with, you can't build a single wall of sheet piling very high because it is supported at only two levels—the bottom and the point where the batter piles connect. And you can't put in a second row of supporting batter piles because driving them would be almost impossible after the first row is in. So the height of the sheet piling is limited by the strength of the sheet piles acting as simple beams supported at two points. In this case the piling was



DRIVING THE PILES—During the first phase of the job, floating derricks and scow-mounted crawler cranes with Vulcan 50C hammers drive sheet piling for the lock walls.

MZ 32, and the unsupported height was less than 15 ft.

Another factor necessary for this type of cofferdam is a good bottom. The cellular type can sit on almost any bottom because it depends on gravity for its stability. But a single-wall cofferdam requires an impervious bottom to hold the piles.

Also the variation in water level must be relatively small because a constant head is important in keeping the joints watertight. On this job the variation is less than 2 ft. The top of the cofferdam averages 7 ft above water level.

#### Unusual Lock Design

The Calumet lock is 110 ft wide and a standard 1,000 ft long to match the other locks in the Mississippi River system. It will have 1,000-ft guide walls at both upstream and downstream ends, and there'll be a 300-ft dam across the river to control the water level.

Both lock walls and dam will consist of a series of permanent sheetpile cells filled with crushed stone and capped with concrete. There are 86 cells in the lock, 19 in the dam. Each cell is 28x26 ft and is elliptical. Sheet pile diaphragms separate the cells.

Sheet pile construction is cheaper than the concrete gravity walls normally specified for locks. It also means that the contractor does not have to build a cofferdam for the walls and dam. But a temporary cofferdam is needed for the concrete gate blocks at either end of the lock. This is where Fitz Simons and Connell built their single-wall cofferdams.

They drove the permanent wall cells first. From both ends of the outer wall they extended the temporary single wall of sheet piling in a rough arc to meet the shore. Then they dewatered the whole lock so they could pour the concrete for the gate blocks.

#### **Driving the Piles**

Another reason why Fitz Simons and Connell were able to bid low on the job was that Merritt-Chapman & Scott had a lot of the right kind of floating equipment based in the Great Lakes area and available for this job. They were able to get the rigs to the job fast and drive all the piling within three months.

The contract was awarded in July of last year. It took them a month to build a mile-long permanent access road and get their plant set up. Then between August and December they drove 6,000 tons of piles, of which 5,000 tons were sheet piling.

They had to drive 7,100 lin ft of bearing piles under the walls first, then 372,000 sq ft of sheet piling for the cells. They started at several points simultaneously with five pile driving rigs. Two of the rigs were floating derrick barges that mounted 15-ton stiffleg derricks and either Vulcan or McKierman-Terry hammers. Two 35x135x9-ft scows carried a Manitowoc 3000 and a Lima 1201 respectively. Both these cranes mounted Vulcan 50C hammers.

The fifth rig was a Manitowoc 2000 that operated from the shore to drive the inner sheet piles for the guide walls. These piles had to be driven only 4 ft into easy ground so the contractor was able to do the job cheaply with a 2,-



DEWATERING THE COFFERDAM—Six 12-in, diesel-powered pumps do a fast job of dewatering. With single-wall sheeting, head caused by pumping helps locate leaks.



Walter Ware, president and general manager, Tru-Mix Concrete, Inc., Portland, Oregon

## FLEET OWNER REPORTS...

# "NEW UNION 7600 GASOLINE IS MAKING MONEY FOR US"

"Our records prove New Union 7600 Gasoline is making money for us-

"Better performance is the unanimous opinion of our drivers. New 7600 Gasoline is giving better-than-ever performance throughout our fleet of Internationals and Diamond Ts. Greater power in every gear, fewer downshifts, mean more trips per unit per day.

"Increased mileage was noted immediately after we switched to New 7600. Fuel consumption dropped significantly when engine ignition was advanced to take advantage of its higher octane rating.

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burning. Carbon deposits in the combustion chamber, and replacements of fouled plugs are the lowest in our 12-year operational records."

As Walter Ware and other Western truck fleet operators have discovered — Union's New 7600 Gasoline is powered like a premium but priced like a regular.

New 7600 has the highest octane rating of any regular in the West...high enough to give knock-free performance to 4 out of 5 vehicles on the road.

And more: New 7600 contains Union's exclusive additive NR76 to keep carburetors cleaner, free from gum.

New 7600 is now available generally in the West. Contact your Union Oil representative for immediate delivery.

## UNION OIL COMPANY OF CALIFORNIA

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UNION OIL CENTER, LOS ANGELES 17, CALIFORNIA, U.S.A.

### LIGHT COFFERDAMS CUT LOCK COSTS . . . continued

400-lb Conmaco hairpin drop hammer.

When the wall cells were in, FitzSimons and Connell started on the temporary cofferdams at the ends of the lock. One of the derricks first drove the batter piles with a McKiernan-Terry 9B3 hammer. The derrick had an 85-ft boom and 60-ft swinging leads.

The batter of the piles varied from 7:12 to 10:12. It was necessary to change the batter at corners and sharp turns in the wall so that one line of batter piles could overlap the next one to get around the corner. The batter piles are 12H53 sections, 50 ft long. On the average, 30 ft of the pile is underground.

The next step was to connect the piles with a continuous horizontal wale. The wale is made up of 12H53 beams set end to end with their webs horizontal.

A clip angle fastens the pile to the wale. The clip was cut from scraps of 12I'53 beams or from Z sheet piling because no standard angle section was heavy enough to do the job. The flange of the clip angle was bolted to the pile with fourteen 14-in. bolts in each joint.

Under the compressive forces set up in the joint, the wale has a tendency to twist and buckle. To prevent this, four ½-in. stiff-ener plates were welded between the flanges at each connection with the batter piles. Two of the stiffener plates went on top of the web of the wale, and two went under the web.

When the wale was bolted in place, it served as a guide for driving the sheet piling. After the piling was driven, it was bolted at intervals to the wale.

Construction of the single-wall cofferdam went quickly. After it was all complete, Fitz Simons and Connell figured they had completed the cofferdam structure at the rate of 20-30 ft per one-shift day.

#### Dewatering

There are a few tricks involved in making a single-wall cofferdam watertight. But if you know how to do it, you can usually make it drier than a cellular cofferdam.

Fitz Simons and Connell started by putting a waterproof compound in the interlocking joints



SINGLE-WALL COFFERDAM — H-beam batter piles brace single wall of MZ 32 sheet piling. Earth berm helps support sheet piling so excavation can go deeper.



JOINT DETAIL—Specially fabricated clip angle connects top of batter pile with horizontal H-beam wale. Joint was designed to withstand compression loading.

when they drove the piles. This helped keep the water out, and it also will act as a lubricant to make the piles easier to pull at the end of the job.

Another trick in dewatering is to pull down the water level on the inside of the cofferdam very quickly to create a head of several feet. At first the joints leak badly, but the water level differential makes it obvious where the leaks are, and they can be filled with cinders.

Fitz Simons and Connell set up six 12-in. diesel-powered pumps to get the dewatering off to a fast start. Men on a walkway around the inside of the cofferdam shoveled fine cinders against the wall whenever they saw the joints leaking. The powerful pumps maintained the head so the suction pulled the cinders into the joints to seal them.

As they plugged the leaks, less pumping was needed. Toward the end of the dewatering operation, only two of the pumps, working at half speed, were able to do the job. At present one 6-in. electric pump, operating intermittently, keeps the cofferdam bone dry.

Fitz Simons and Connell find that the single-wall cofferdam, once it is properly dewatered, is



CONCRETING—Crews pour concrete for gate blocks of lock behind cofferdam, Concrete work must be especially accurate be-

cause sector lock gates require close tolerances. Concrete arrives dry-batched because the plant is too far away for transit-mixing.

drier than a cellular type. The reason is that leaks-are immediately obvious and can be plugged easily. With the cells, water seeps through the gravel fill, and it's hard to spot just where it is coming from.

#### Concreting

The gates in the Calumet lock will be of the sector type rather than miter gates. This means that no big tunnels are required in the lock walls. But it also means that the concrete lock blocks must be formed and poured with unusual accuracy. The 864-ton sector gates are massive affairs, but

they work with precision and require close tolerances at all contact points and joints with the block.

Total concrete required is 30,-000 cu yd, not enough to warrant an on-site plant. The concrete arrives dry-batched in 6-yd trucks because the plant is too far away for transit mixing.

The Calumet River Lock will replace the inadequate Blue Island Lock in the Calumet-Sag system. Its function is to regulate the water flow from Lake Michigan to the Mississippi watershed and to permit control of the water levels in the navigation areas be-

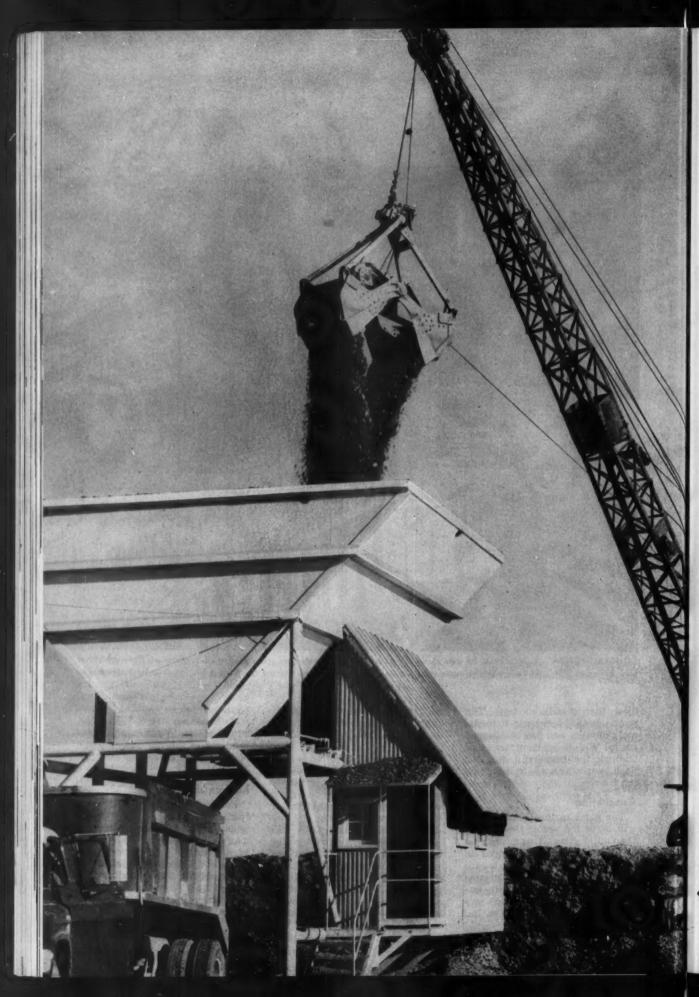
hind the lock.

Construction now is more than 30% complete and running slightly ahead of schedule. Completion of the lock is scheduled for May, 1961.

#### Men on the Job

For Fitz Simons and Connell, Herbert L. Taylor is construction manager, Fred Hazard is project manager, F. L. Van Sickle is superintendent.

For the Corps of Engineers, L. S. Kreger is resident engineer for the entire Calumet-Sag Project. R. R. Ramsdell is project engineer at the lock.



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# (USS) "T-1" Steel outlasts other steels 3 to 1 handling oyster shells, sand and gravel

at Southern Materials Corporation, Freeport, Texas

"It takes a mighty tough steel to scoop cubic yard after cubic yard of oyster shell, sand and gravel day in and day out—and still not break down under rough handling and wear. In this service, USS "T-1" Steel outlasts other steels used three to one."

These are the words of a big Texan, L. M. (Buck) Clark, who started as a blacksmith and worked up to vice-president and assistant general manager of Southern Materials Corporation, Freeport, Texas. The firm provides wholesale quantities of oyster shell, sand and gravel dredged up from the Gulf bottom for fill, road construction, concrete work and the like.

All day long, the big cranes scoop up the sea material from barges and deposit it in nearby hoppers. Skilled as they are, the crane operators can't help banging the bucket against the walls and floor of the barges while picking up shell, and against the lips of the hopper at times. All that impact hastens failure in conventional materials. This leads to shutdowns and that's what they don't want.

In the past their 1½-yard clamshell buckets lasted for about six months handling sand and gravel and about twice as long scooping shell. One repair job cost \$1,280 and results were no better. Then it was decided to substitute USS "T-1" Constructional Alloy Steel for the lips, end panels and side panels of the buckets. The repair job was done in the company shop and cost about \$500. Mr. Clark says, "It's been two years since I put that "T-1" Steel in there, and it's still holding up fine."

The USS "T-1" Steel used was furnished to 321 minimum Brinell hardness and does a much better stand-up-take-it job than anything else that was tried.

Besides resistance to impact and abrasive wear, "T-1" Steel solved a severe case of corrosion from salt air in both the bucket and the hopper. Corrosion build-up had to be chipped away in the old equipment causing a lot of downtime. "T-1" Steel reduced maintenance about 50%.

This is a good example of what USS "T-1" Steel can do in materials handling equipment. It has a very high minimum yield strength of 100,000 psi so can be used to save weight. It retains remarkable toughness—down to 50°F below zero. And it can be worked and welded.

United States Steel also makes a well-known group of high-strength low-alloy steels for construction work, having a minimum yield point of 50,000 psi. These include USS MAN-TEN Steel for strength with maximum economy, USS TRI-TEN Steel for strength with toughness, and USS COR-TEN for strength with outstanding atmospheric corrosion resistance. For more information on any of these steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS, "T-1," MAN-TEN, TRI-TEN and COR-TEN are registered trademarks



Bucket frequently bangs against bottom of barge causing fatigue cracks. USS "T-1" Steel's greater toughness and resistance to impact abrasion and corrision more than tripled bucket life.

United States Steel Corporation — Pittsburgh Columbia-Geneve Steel-San Francisco Tennessee Coal & Iron — Fairfield, Alabama United States Steel Supply — Steel Service Centers United States Steel Expert Company

## **United States Steel**



Bucket and hopper parts made of USS "T-1" Steel last three times longer because of "T-1's" high resistance to impact abuse, abrasion and corrosion.



Rock Bottom
Hauling
Costs
with
Euclid
Rear-Dumps

THE simple but rugged design of Rear-Dump "Eucs" has provided cost cutting performance in mines and quarries for over 25 years. This unmatched experience in building dependable off-highway haulers, combined with continuous product improvement and excellent dealer facilities for parts and service, results in high job availability and low maintenance cost.

Euclid's line of rear-dump haulers for mine, quarry and construction work is the most complete in the industry. With standard or quarry bodies, there are models with 10, 15, 18, 22, 27, 40 and 55 ton payload capacities...engines from 128 to 670 total h.p...5 and 10-speed transmissions and Torqmatic Drives. For close quarter work there are three over-hung engine models with semi-trailers of 12, 22 and 35 ton capacities.

Have the Euclid dealer in your area give you complete information on the models that fit your requirements. He can show you how "Eucs" cut hauling costs and bring a better return on your investment.

**EUCLID** Division of General Motors, Cleveland 17, Ohio



## EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



THIRTY BAYS—Barrel arch roof of freight station in Los Angeles consists of thirty 117-ft-long bays that span 44 ft between

supporting columns. Contractor built enough trussed form sections to build six bays at a time. Each form section is reused five times.

## **Arch Forms See Lots of Action**

Each 44x18-ft trussed arch form section will get five reuses in construction of a freight station with 30 identical barrel arch bays.

TRUSS-SUPPORTED form sections span 44 ft between columns to form a barrel arch roof consisting of 30 identical 117-ft-long bays for the Union Pacific Railroad's freight station in Los Angeles.

There's no wasted time in setting or stripping forms. The contractor erects the trussed arch forms for one bay in just three hours, strips them in only two hours.

Each barrel arch form is 18-ftwide. Two timber trusses spaced at 13 ft support the curved plywood sheeting. The contractor built enough forms for six bays of the 30-bay structure. Each form will be reused five times.

The 30 bays extend 1,332 ft along the railroad tracks. Each bay is 117 ft long with a 10-ft cantilever at one end to protect a truck loading platform. Thickness of the barrel arch shell is 4

in. Height of the crown above the tops of the supporting columns is 12 ft, 3 in.

Heavy columns resting on concrete caissons that go down 15 ft into the sandy clay soil support the barrel arch vaults. The caissons are belled at the bottom.

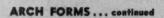
#### **Building the Forms**

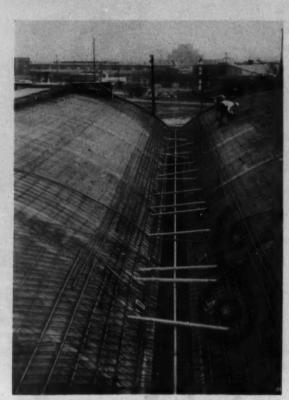
Workmen assemble the trusses at the site. They lay out timber sections on a plywood template, cut them to size, and bolt them together. Gusset plates at the connections are 7 ply, 1-in.-thick sheeting. Then the crew stands the trusses up and adds timber stringers and plywood sheeting.

After setting timber shoring posts, the contractor erects the forms for one bay. A crane picks up each form unit and places it on top of the posts. Square holes along the edges of the forms leave an opening so that a sling can be

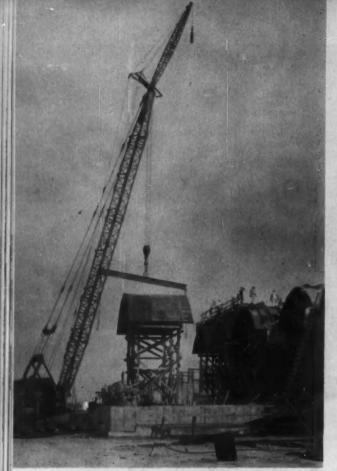


ASSEMBLY—Workmen put together pieces of timber that make up supporting trusses.





REINFORCING—No. 4 bars spaced at 51/2 in. reinforce 4-in.-thick barrel arch shell in both directions. Edge beam separates bays.



CRANE SETS FORM—Sling holds 18-ft-long form section for the barrel arch roof. It takes seven panels to form a complete bay.



CONCRETING—Buggy dumps load of concrete brought to site by transit-mix trucks onto arch forms. Curved tubular screed strikes off concrete, floats give it rough finish.

attached to the truss timbers for lifting.

With the forms for one bay in place, the contractor places reinforcing and prepares for concreting. Reinforcing in the barrel shells consists of No. 4 bars spaced at 5½ in. in both directions. At the ends of each vault additional bars cross the shell diagonally to strengthen the corners.

#### **Edge Beams**

Reinforcing in the beams between bays is massive. As many as 36 No. 11 bars reinforce each of the 2x3¾-ft beams. In fact the ratio of reinforcing for the structure as a whole is high. In all 450 tons are required. A crew of 40 men can concrete about two and a half bays in a single day. Transitmix trucks deliver concrete to the site. A crane handles transfer of the concrete from the trucks to push-type buggies that haul it along timber runways at the crown of each barrel arch to the pour area.

The workmen strike off the lightweight concrete with a curved continued on page 122

Page 118—CONSTRUCTION METHODS and Equipment—June 1959



# GIANT PRODUCTION! LOW-COST OPERATION! GET 'EM BOTH IN THE MIGHTY D9!

From every angle the Cat D9 Tractor is a "take-charge" giant...capable of giant production. Here's 30 tons of steel engineered and manufactured into a rugged, reliable machine that refuses to falter when the going gets tough.

The heavy-duty, seven-roller track frame is built to take the punishment of heavy loads. "Hi-Electro" hardening of wear areas of the undercarriage gives extra dependability. Extra-strong frame and final drive form a backbone built for long life under the severest operating conditions.

The turbocharged D9 Engine puts out 320 HP at the flywheel. 'Dozing, pulling or pushing — this means peak production on any job. Despite its size and power, the D9 is easy to operate. Hydraulic boosters provide power for steering, braking and master clutch use. Finger-tip control helps keep the operator at top efficiency.

The D9 is easy and economical to maintain. The exclusive Caterpillar oil clutch operates up to 2,000 hours—one whole season—without adjustment. And it needs adjustment no more frequently than ordinary clutches need replacement. Proper track tension is quick and easy to apply with Cat hydraulic adjusters.

NEW FEATURES FURTHER REDUCE MAINTENANCE COSTS: Lifetime lubricated rollers and idlers — tested for  $2\frac{1}{2}$  million hours—need no servicing until rebuilding. New dry-type air cleaner removes at least 99.8% of all dirt and

dust from engine intake air throughout every service hour. Cleaner can be serviced in 5 minutes; filter element re-used.

A complete line of attachments and scrapers make the mighty D9 a versatile profit-maker. Scrapers available for use with the D9 are the No. 463 Series C, which carries 22 cu. yd. struck, 28 heaped, and the No. 491 (27 cu. yd. struck, 34 heaped). Fast loading, efficient ejection and spreading step-up cycle time with either one. A full line of bulldozers and controls insures the right combination to handle any 'dozing job. Two rippers are available...the No. 9 for normal ripping and the Kelley Ripper with single tooth for extra-deep penetration.

These are just a few of the plus features found in the D9 Tractor—features that make the D9 "King of the Crawlers." The real proof is in a demonstration on your job. See for yourself. Call your Caterpillar Dealer now.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

## CATERPILLAR

GET TOP PRODUCTION WITH A TAKE-CHARGE DS



Bethlehem Form Stakes
Easy to drive for fast anchoring

The strong projectile point on Bethlehem Form Stakes quickly penetrates even the hardest road base... speeds the anchoring of steel forms for highway work.

#### HIGH-STRENGTH STEEL

Bethlehem Form Stakes are made of highcarbon, high-strength steel. They can be driven with a sledge or with power tools. You can really treat them rough, for they have the toughness to withstand repeated battering. They are economical, too, because these rugged stakes can be pulled out and re-used, time after time.

#### BUNDLED FOR EASY HANDLING

The stakes are made in any diameter and can be furnished in various lengths. They come well strapped in one-man bundles which are easy to handle and store.

#### OTHER STYLES AVAILABLE

In addition to the plain-end stake which is commonly used, Bethlehem Form Stakes can also be supplied with chamfered ends and with upset ends, to meet special needs. Tell us about your requirements. Get in touch with the Bethlehem sales office nearest you. Or write to us at Bethlehem, Pa.

#### BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

\*Export Distributor: Bethlehem Steel Export Corporation\*

## BETHLEHEM STEEL



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# OLIVER

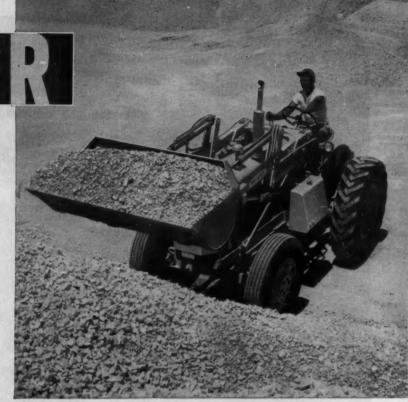
## — let us demonstrate on your jobs!

You be the taskmaster—tough, demanding and with the "I'm from Missouri" attitude.

We're looking for the critical user, to show what these new Oliver tractor-loaders can do—all they can do to get your digging-loading cycles up, job costs down, and bring in better income returns over the long haul!

Just tell us where and when. We'll put the Oliver of your choice on the job you name. You work it, actually earn with it for a demonstration that we sincerely believe will open your eyes to the progress that has been made in tractor-loaders by Oliver.

Set up your "free sample" of Oliver work-power in action. Call your Oliver distributor now for a demonstration. Absolutely no obligation of any kind, of course.



## TRY THIS "FREE SAMPLE" OF OLIVER WORK-POWER

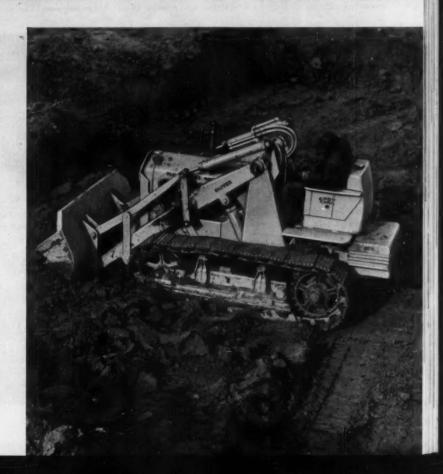
3 on rubber! Choose from the Oliver 12-cu.-ft. Model 558... ¾-cu.-yd. Model 778...1-yd. Model 888. The last two are available with Oliver's famed "Reverse-O-Torc" transmission, which gives you instant, finger-tip reversing without shifting or clutching. All are today's newest wheel loaders—fast, agile and full-powered, with engine and hydraulics matched to perfection to lift, dig and move materials faster, easier.

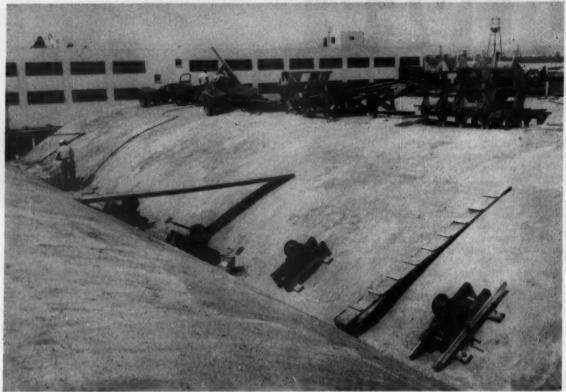
3 on crawlers! If a crawler loader is your need, select from this 3-loader line-up by Oliver—all with "Spot-Turn," wet clutch steering. Try the Oliver OC-46, most rapid-performing loader in the ½-yd. size. Look at the Oliver OC-126, the 1½-yd. standout. In the big 2¼-yd. loader class, the new Oliver OC-156 is the most modern of its size. And you get extra value by working any Oliver tractor-loader with a variety of attachments.

Don't let old buying habits keep you from knowing all that's new with Oliver. Arrange a demonstration now!

## THE OLIVER CORPORATION

Industrial Div., 19300 Euclid Ave., Cleveland 17, Ohio A complete line of industrial wheel and crawler tractors and matched allied equipment





WINCHES LOWER FORM—Winches set over holes left open through the concrete shell lower a form section onto a timber frame

that rolls on four-wheeled dollies after supporting timber posts are knocked away. Contractor strips forms for one bay in two hours.



MOVING THE FORMS—Workmen push form carrier to clear aisle left open in each bay for moving forms. There front-end loader



hooks on and hauls it out from under. Slanted timber posts along sides of aisle support steel beams that hold trussed form sections.

tubular screed. They finish up with floats that give the concrete a rough finish.

Stripping the forms is a neat operation. The contractor places small hand winches on top of the poured barrel shell over small holes left open through the concrete. The winch cable is dropped through the hole and hooked onto the timber truss underneath. Then the crew knocks out the timber

posts that support the trussed forms during the pour and lower the form with the winches onto frames that roll on four-wheeled dollies.

#### Moving to Next Pour

A front-end loader pulls the form section on its carriage through an aisle that crosses each bay and on into the next bay to be formed. In each bay a clear

aisle is left open by using steel beams to support the form sections overhead. Timber posts slanted from the sides of the aisle hold the steel support beams.

Diversified Builders, Paramount, Calif., holds the \$2.4-million contract for the project, which includes a two-story, glass-enclosed office building and two small onestory buildings besides the freight station.

In all kinds of weather

... on all type jobs be they
construction, quarrying,
mining or logging...
rugged built-with-NYGEN\*

## GENERAL TRUCK TIRES

deliver far more than your
money's worth in time-saving,
cost-saving performance
day in . . . day out!

Specify GENERALS on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO

## Operator training a problem?



# LOOK HOW MICHIGAN SCRAPERS LICKED IT FOR THIS N. J. CONTRACTOR

Take a look at the operators on Sallcon Incorporated's scrapers. You're liable to see a new man every week or two. The reason is the high cost of labor. Handling mostly small contracts, this Somerville (New Jersey) firm frequently finds it most economical to lay off men between jobs—then rehire when they go onto a new site. "In half a month's

time," explains Jim Seibert, company president, "we may be forced to use two or more different operators per machine."



High travel speeds reduce waste time on jobs like this 48 acre, 150 home development in Middlesex County, N. J.

## Clutching-none

"Under these conditions, it's naturally important to us that scrapers be as easy to operate and as easy to take care of as possible," continues Mr. Seibert. "We looked at them all... and decided on 10½ yard Model 110 Michigans. Their power steer, power shift, and torque converters take the effort out of moving dirt! New operators become pretty proficient after only a few cycles. Nobody wears away clutches, because there is no foot clutch. Gear selection is no longer critical; torque converter drive automatically balances speed and load.

"Michigan's hydraulic system is simple to master, also. The power train is easy to get at. What's more, based on our experience of last season, I feel Michigan 110's will prove extremely dependable over their entire working life."

## Output-160 pay yds hourly on 500 ft cycles

Production has been very good! On a typical housing development job, cutting roadways, each Michigan averaged 20 loads per 50-minute hour. One-way hauls were approximately 250 ft. Loading, with 85 hp pusher, took 40 to 45 seconds. Payloads in clay averaged 8 bank yards.



Positive ejection spreads load in seconds. Michigan controls are all-hydraulic; are actuated by easy-to-reach short-throw levers.

Power steer, no-clutch power shift-torque converter drive, good visibility help ease operator training.





A typical Michigan payload: 8 bank yards of clay, Pusher is an 85 hp crawler, Load time: under 45 seconds.

On tougher jobs—cutting railroad sidings and excavating industrial basements, for example—the 162 hp Michigans frequently are teamed with a 140 hp pusher (which cuts load time to 25 to 30 seconds).

## Self-loads satisfactorily

Occasionally they work alone, self-loading close to their 8 yd struck capacity.

In tight-quarter assignments—like grading between houses and building driveways—their power steer and short turn radius speed cycles.

The machines drive everywhere under their own power. Speeds up to 31½ mph.

## Check Michigan Scraper advantages on your job

Mobility, versatility, output—and ease of operation like this—we think, can help you too. For proof, we'd like to show you, first-hand, what Michigan Scrapers can do on the only job you really care about—your own! Let us bring a demonstrator to your work area. Let your own operators run it. Measure output. Compare performance. Then pick the size you need! Three models available, 10½, 19, 29 yds heaped.

Michigan is a registered trademark of



## CLARK EQUIPMENT

Construction Machinery Division 2403 Pipestone Road Benton Harbor 13, Michigan

In Canada: Canadian Clark, Ltd., St. Thomas, Ontario



How progressive Indiana quarry has kept pace with rising production demands...

## 4-yard Tractor Shovel slices semi & tandem load time 75%

#### Original problem: Too-slow loaders

Like many quarries, Meshberger Stone Company, Columbus, Indiana, used to handle stockpile loading with power shovels and bucket loaders. Worked okay . . . until 1955 when the company started selling more grades of stone. Then—because these rigs couldn't move fast—or load fast—production suffered. Trucks were delayed, output goals unattained.

#### Two-year solution: Greater loading speed

Into this situation moved a rubber-tired Tractor Shovel—with the same advantages owner Leon Meshberger found had already helped some 20 other nearby quarries. The new machine was a 2½ yd Michigan Model 175A. It cut load time in balf—two minutes for a typical 9 ton truck. And, by traveling between stockpiles at high speeds, it virtually eliminated truck waiting time.



## Today's solution: Still more speed

The 2¼ Michigan served Meshberger well until last year when the picture changed again. On one hand, demand went up so much, plant capacity was increased. Two, fleet owners had found it cheaper to haul in bigger haul units. Again Meshberger sought a way to cut load time. His move was a natural one: to a still larger Michigan . . . this then-newly-introduced 4 yard Model 275A.

#### 4 yards per pass

Loading capacity of this new Michigan has proved all that was expected—and more! Fifteen ton tandems now need only 3 passes, 45 to 90 seconds, to load. Twenty-two ton semis are heaped in only 4 to 5 passes, 2 minutes. Load time is two-thirds that of the Model 175A... one-fourth that of bucket loaders!



#### Material: ag lime to 6" stone

Loading of all 15 crushed grades is ably handled by the 262 hp Model 275A: from ag lime (above) to 6" stone—over 400 tons an hour. In readily-heaping powdery lime, bucket loads often weigh 8 tons each. In coarse stone they average 5½ tons each.

## Loads small trucks effectively, too

Material goes into many different kinds of haulers, pickups to trailers. The 4 yard Model 275A handles them



all. On smaller sizes, like this 6 ton dump truck, Michigan operator Verne Fawbush merely lets bucket extend over rear of truck bed toward stockpile. This way, most of the excess material from the one or two passes falls back on the stockpile; balance is cleaned by one quick swipe of the bucket.



## "Good job" in shot rock

At times, the 4 yd Michigan helps out in the pit. Power, size, and reach are ample to feed the 15 ton rock wagons. Despite absence of rock bucket, unit does "good dependable job" lifting the heavy, jagged ledge material and carrying it over rough footing to the trucks.

#### The future:

Speed and capacity of his 4-yd Model 275A Michigan "should handle our expansion for years to come," forecasts Mr. Meshberger. But should things boom unexpectedly, the next step is here! Michigan's biggest model—the 6 yard 375A—is already being used in many pits! Could its 6 yard (or the 275A's 4 yard) "bites" help solve your production problems?

Michigan is a registered trade-mark of



## CLARK EQUIPMENT COMPANY Construction Machinery Division

2403 Pipestone Road Benton Harbor 11, Michigan In Canada: Canadian Clark, Ltd., St. Thomas, Ontario



600 hp Michigan replaces tandem-pushers on Hugh Steele Inc. highway job

## Earns \$126 extra

"Earning their keep!?! Why, in a year, I could run them into the middle of the Chattahoochee River, and still walk away with a profit!"

Hugh Steele is talking about three rubber-tired Michigan Dozers that are making their mark in big, bold dollar signs all around his 18.1 mile highway contract near Ashburn, Georgia.

Biggest profit producer is in the cut. It's a 600 bp Michigan Model 480! This big rig started out in demonstration against two 190-hp crawlers pushloading in tandem. The results were so one-sided Mr. Steele wouldn't let Atlanta distributor Stith Equipment Co.

take the Michigan off his job.

## Scales, stop watch tell the story: 14 more loads per hour

With scales and stop watches, this production story was recorded:

Material Scraper capacity (each of 12 machines)	15 P. C. P. (1975)	Crawlers Sandy clay (3000 lbs/yd) 25 yds heaped
Average load time Pusher cycle time	30 seconds 60 seconds	44 seconds 84 seconds
Average payload, scale weighed Average pay yds Scraper loads per 50-min hr.	60,000 fbs 20.0 50.0	48,600 lbs 16.2 35.7
Scraper output per 50-min hr.	1,000.0 yds	578.3 yds

In terms of cold cash, these figures mean simply that the Michigan earns more dollars per hour. A lot more! In 30c dirt, its extra earnings average \$126 per hour over tandem pushers, according to Mr. Steele.

## Faster pushing nets bigger pay loads

Watch a few push-loading cycles and you'll see why. The Model 480 has half again as much power as the two crawler-pushers combined. It backs up faster than crawlers, and being one machine instead of two, naturally positions faster (24 seconds faster, on the



Biggest Michigan of all, this 600 hp Model 480, does more work than two big crawlers combined.





Steele's two 262 hp Model 280 Michigans spread and compact 20,000 yds of fill a day. In "spare" time, units also handle such scattered odd jobs as dressing stockpiles (below), towing disabled vehicles, backfilling around culverts.

## per hour

average, on this job). It pushes faster (at speeds up to 5 mph), which both reduces load time and keeps the dirt more "alive." Result: higher, tighter, bigger loads—and more of them.

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## Other Michigans save time on fill-compaction assignment

Just as the big Model 480 is producing profits in the cut, so too are two other Michigan Dozers saving money for Owner Steele on the fill. These units are both 262 hp Model 280's. They are spreading fill and compacting ... achieving specified 95% Proctor in

two to three high-speed (7½ mph) passes.

#### Speed scattered odd jobs

And that's not all. Go-anywhere 28 mph mobility allows the Michigans to sneak away from main assignments to tackle emergency jobs. Towing disabled vehicles, for example. Back-filling around culverts. Building up low spots in haul roads.

These are just a few of the odd jobs. But the real advantage of Michigan Dozers, Mr. Steele says, is their ability to outperform crawlers on many production

jobs too And do it day after day, with dependability equal to that of Michigan Tractor Shovels. There are four size Dozers to choose from: 162, 262, 375, and 600 hp. Your Michigan Distributor will be glad to show you one in action so you can judge its advantages for yourself.

Michigan is the registered trademark of CLARK EQUIPMENT COMPANY Construction Machinery Division



2403 Pipestone Road Benton Herber 16, Michigan In Canada: Canadian Clark, Ltd.



USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

## "It's A Gusher!"

Anyone who has seen them in action will tell you the same thing. The new Homelite "300" Pumps are really gushers. They handle 300 gallons per minute... 18,000 gallons per hour. They dewater trenches, ditches and other excavations in the fastest possible time. With their variable throttle, you get economical seepage control to keep excavations workable and your men on the job.

tions workable and your men on the job. The new Homelite "300" Pumps notonly work faster . . . they last longer. Standard equipment on all the "300" pumps is a new shaft seal that mates carbon seat against ceramic coated bronze ring. This new seal lasts up to 25 times longer under toughest working conditions.

Only 103 pounds, complete with builtin gasoline engine, the "300" pumps can be put to work anyplace fast. They self prime at 28 ft. above water level. They handle muddy water without clogging. And they start and work in any weather.

See them in action soon. See the quiet, slow-speed model for economical, high capacity pumping... or the standard-speed model for general jobs where higher discharge pressures are required... or the high-volume pressure pump model for jetting, pumping through long discharge hose or piping and other jobs requiring top discharge pressures. We'll gladly demonstrate any or all of these models at your request.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

## HOMELITE

PUMPS GENERATORS . BLOWERS

HOMELITE • A DIVISION OF TEXTRON INC., 1002 RIVERDALE AVE., PORT CHESTER, N.Y. In Canada — Terry Machinery Co., Ltd.

\$75,000 EXCAVATING BUSINESS in just 14 months



with CASE.
TERRAMATIC. DRIVE



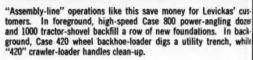
LEVICKAS EXCAVATING CO., OAK LAWN, ILLINOIS

## Our books prove we we bought Case

Ted Levickas and his wife, Doris, have good reason to look pleased as they study the rapid growth of Ted's excavating business, in the quiet confines of their efficient "home office". Ted and his father, Peter, also expect to build 20 new homes this year — 10 on contract and 10 on speculation.



Levickas claims his Case Terramatic Drive dozer can carve out basements the vicks claims his case retrainate brive docer can carve out basements in a fraction of the time required by conventional rigs. By pushing dirt outward to form ramps at both ends of hole, this 5' deep excavation for a 26' x 46' poured basement was completed in just 3½ hours, including holding to within 2" of final grade.



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## made the <u>right</u> decision when TERRAMATIC DRIVE Crawlers"

Ted Levickas. Oak Lawn, Ill., is fast becoming known as one of the busiest and best excavating contractors in the Chicagoland area. Key to his remarkable success is his Case Terramatic Drive crawler tractors, which actually put him in the excavating business.

Ted started his business career 12 years ago as a residential contractor. Working with his dad in the Father & Son Construction Co., he finally became "fed up with paying through the nose" for excavating and grading service on homesites. "I figured we could save money, and increase efficiency by owning our own equipment," he explains. With the assurance of additional excavating work from several builder-friends, Ted decided to give it a whirl.

#### Started Excavating as "Sideline"

After experimenting with various types of equipment, he finally purchased a 1½-cu. yd. Case Model 800 tractor-shovel. "Terramatic Drive sold me," Ted explains. (This exclusive combination of torque converter and 4-speed constant-mesh transmission actually "senses" changing loads... increases push-pull power instantly, automatically... with no clutching, shifting or stalling. Simple hydraulic controls provide on-thego power-shifting, plus an independent forward-reverse drive on each track for increased speed and maneuverability.) "In just a few days I was outproducing conventional loaders two-to-one," Ted stated.

#### **Business Starts Booming**

As word of Levickas' new excavating service got around, orders began to pour in from other builders. Last September he traded his original "800" for a bigger, more powerful Case Model 1000 tractor-shovel, and a Model 800 power-angling dozer. He also organized a separate company — Levickas Excavating Co. — to specialize in excavating and grading work. This spring, he added two more Case units — a \( \frac{5}{6} \)-cu. yd. Model 420 crawler-loader and a Model 420 wheelmounted backhoe-loader, for small-yardage excavating and clean-up jobs.

#### Better Service - Builds \$75,000 Business

ckas' cus-

ling dozer

In back-

"Being a builder myself, I appreciate the importance of prompt service, and a clean, accurate job that requires a minimum of hand finishing," Ted adds. "Now with the extra speed and precision control of Case Terramatic Drive, I can give my customers more of both. For example, when I hired work done, it took a subcontractor with a conventional gear-shift tractor a full 8-hour day to dig ONE 28' x 40' basement. Now, one of my Case machines can dig THREE basements that size in just 10 hours. This means I can pass on a substantial saving to my customers, and still make a reasonable profit myself." And apparently Ted knows whereof he speaks because, in just 14 months, his excavating "sideline" has blossomed into a healthy \$75,000-a-year business — and it's still growing!



Geared for fast service — Ted Levickas hands work-orders to his operators. (L to R — John Wilson, Joe Koncius, Ed Vacala and George Paser.) Equipment includes 4 Case rigs, two dump trucks and two tilt trailers. Ted plans to add two more Case crawlers soon.



Operator George Paser finds the combination of Terramatic Drive and exclusive Case power-angling blade save time and temper, grading around columns and close to walls on this shopping center job. A carpenter for 14 years, Paser became an expert with Terramatic Drive in one week.

Ted operates the Case 1000 tractor-shovel up to 12 hours a day himself and still has plenty of energy for supervising his building business. The secret, according to Ted, is Terramatic Drive which eliminates all clutching and shifting with effortless hydraulic controls.



## "I'd recommend Case **Terramatic Drive** to anybody"

After building a \$75,000 excavating business in just 14

months, it is perhaps only natural for Ted Levickas to give such an unqualified endorsement to Case® Terramatic® Drive crawlers. Says Ted, "They will whip any machines in their class I've ever seen - and to prove we mean what we say, we plan to buy two more Case units in the near future. Service from our Case Dealer has been excellent."



Ted Levickas (right foreground) takes time out to look over a brand new Case 1000 Till-Crown Dozer, which the Case Dealer, Nord's Tractor and Equipment Service, Villa Park, Ill., has brought out to demonstrate. Explaining the unique blade, which tilts hydraulically from the operator's seat, are John Slivka (left) vice pres., and Bob Kaphen, salesman for Nord's.

#### CHECK THE COMPLETE CASE INDUSTRIAL LINE



1000 100 HP\* Diesel with exclusive Terramatic Drive, torsion-bar suspension, automatic track lubrication.

420 42 HP\* Gas with ferrometallic clutch, 3-speed gear transmission and improved total-contact differential steering.

W-9 Terraload'r, 6000-lb. capacity, 4-wheel drive, rearwheel power-steer.  $1\frac{1}{4}$ ,  $1\frac{3}{4}$ or 23/4-cu, yd. bucket. Gas or Diesel engine with torque converter, power-shift, power-transfer differential.



800 80 HP\* Diesel with exclusive Terramatic Drive, torsion-bar track suspension automatic track lubrication.



Terraload'r. 3000-lb. capacity, front-wheel drive, rear-wheel power-steer. 1-cu. yd. bucket. Gas engine with rque converter, shuttle-shift.



600 62 HP\* Diesel or Gas, with torque converter, 4-speed hydraulic power-shift transmission and power-steering.

M-3B 3500-lb. capacity fork lift. 9', 14'3" or 21'4" mast. 50 HP\* Gas engine with torque converter, 3-speed gear transmission and improved total-contact differential steering.

520 50 HP\* Gas, or 45 HP\* Diesel with torque converter, 3-speed gear transmission and improved total-contact differential steering.

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M-420 4000-lb, capacity fork lift, 9½', 14'3" or 21'6" mast, 47 HP\* Gas engine with torque converter, 8-speed shuttle transmission and power-steering.





420 47 HP\* Gas with torque converter, 8-speed shuttle transmission, power-steering.



## MAIL to J. I. Case Co., Dept. F1499, Rocine, Wis., U.S.A.

Send free descriptive literature on items checked:

- Model 800 or 1000 Terrametic Drive crawlers with
- 11/2 or 2-yd. Tractor-Shovel
- Power-Angling Dozer
- ☐ Hydroulic Tilt-Crown Dezer

- Model 600 crawler with
- Model 520 crawler with
- Model 420 crawler with ......
- M-38 Fork Lift
- 420 Wheel Backhoe-Los
- ☐ M-420 Fork Lift
- ☐ W-5 Terraload'r
- ☐ W-9 Terraload'r

Name ...... Title...... Title.....

CT-CL-322N

City ..... State..... State..... Lithe In U.S.A.

## Ask your CASE Dealer for a demonstration

Find out for yourself how Case Terramatic Drive doubles push-pull power instantly, automatically . . . gives unprecedented speed and handling ease for all crawler tractor operations. Make a demonstration date today, or mail handy coupon for full details on any Case wheel or crawler machine that interests you.

## Don't worry about cash!

Your Case Industrial Dealer will gladly arrange an easy monthly financing or lease plan, with seasonal skip-payments if desired, to fit your needs.

## BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

## news and notes from the field

## Overcoming the Problems of Hot Weather Concreting

Hot weather can be made to work for you in concreting-if certain precautions are observed during placing. The dangers of inadequate preparation be-fore placing, high MIX temperatures and poor curing protection should be understood and controlled.

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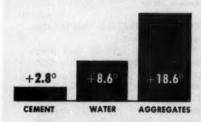
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#### **Effects of High Temperatures**

High temperature accelerates the setting time of concrete and promotes rapid evaporation of moisture. The setting time is based on mix and curing temperatures of 73°F. As the temperature rises the setting time accelerates. When the temperature of the concrete is allowed to climb too high, there is danger of "quick set" and permanent strength damage.

#### What causes High Concrete Temperatures?

The temperature of fresh concrete is affected by the temperature of the materials and the mixing conditions. Take an average five bag mix and increase the temperature of each ingredient 30°. The graph below shows how much each affects the concrete temperature.



What Happens When Temperature of Fresh Concrete Runs Too High

- Permanent strength reduction
- Early stiffening or quick set
- Increased water requirements
- Increased probability of cracking

#### Ways of Reducing Mix Temperature:

- 1. Sprinkle hot aggregate stock piles with hose or fog spray.
- 2. Apply fog spray to aggregates or conveyor belts.
- 3. Use crushed ice in the mix replacing water—pound for pound.
- Avoid stock-piling aggregates directly in the sun.
- 5. Protect mix-water storage and lines from direct sun.
- 6. Avoid the use of strength accelerators in hot weather.

#### **Tips For Best Results**



1. Subgrade should be damp (not muddy) so it will not absorb water from concrete.

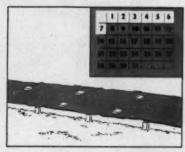


2. Have adequate help available to handle concrete rapidly.

- 3. Discharge MIX as soon as possible after proper mixing.
- 4. In extremely hot weather it may be necessary to shade concrete or use wet coverings until final finishing can be completed.



- 5. In hot dry breeze erect wind break or use fog nozzles on upwind side of fresh concrete.
- 6. Start curing operations as soon as concrete has set enough to avoid surface damage.



- 7. Cure concrete for at least 7 days where durable wearing surface and strength are important.
- 8. Keep test cylinders shaded and damp until they are ready to be sent to lab-oratory after 24 hours.



More information on Hot Weather Concreting is available in Alpha's "Craftsmanship in Concrete" Folder #2. Free copies are available.

PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.

First work on the \$710-million Niagara Power Project is drilling, blasting, and hauling out 40,000,000 yd of rock. Six contractors are working under five major contracts. Each has a particular set of problems. Here is the first part of a two-part article that tells how these contractors are handling one of the biggest rock removal jobs in recent years.



TOUGHEST — So many roads, bridges, and other facilities clutter up the site that the contractor must do the job with several spreads.

per Niagara intake area, continues over

four miles of open conduit, and finishes at

an open canal and generating plants.

CLEANEST — Rock removal for nearly four miles of conduit trench benefits from assembly line drilling,

fast mucking, and clear haul roads.

## Carving a Power Plant

UNITED STATES

NAGABA

OPTION GOVERN

PRINT GOVERN

PRINT

By ANDREW BORACCI Associate Editor

YOU FOLLOW the course the water will take.

It's the best way to look over the five separate construction spreads that are blasting and handling more than 40,000,000 yd of rock—one of the biggest rock jobs ever—on the \$710-million Niagara Power Project. You quickly classify each operation.

1. The toughest job—that's what you call the rock work Merritt-Chapman & Scott Corp. has under way on it's \$66-million contract for construction of two concrete, harmonica-shaped intake structures and the first 8,000 lin ft of twin, covered conduit at the upper Niagara River. There, the contractor is pulling 5,000,000 yd of rock piecemeal from an area crowded with roads, bridges, railroad tracks, and electric transmission lines. You wonder how MC&S makes any progress at all.

2. The cleanest job — that's what you call the 9,500,000-yd





REATEST—The rock is pulled in 20-ft benches to a depth of 110 ft and then processed to become aggregate for all the job contractors.

## **Out of Rock**

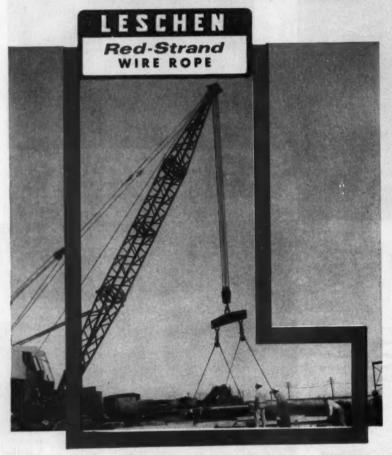
CLASSIEST—Carving the complex ledges, edges, returns, and walls for the pump-generating plant requires the precision of a sculptor.





MOST AWESOME—Buttress walls, draft-tube foundations, and keys for penstocks are cut into a rock cliff-side 150 ft high for main plant.

# when the going gets rough-



When the load is on the crane, you'll be glad you rigged with Leschen—the wire rope that's the same top quality in every foot of every reel. The new Leschen wire mill is designed to deliver exactly that. New machines . . . new processes . . . exclusive new continuous-flow technique—all as modern as tomorrow. Try

Leschen Red-Strand Wire Rope now and see how its uniform quality makes your operation safer, your replacement time farther in the future. Make your next order Leschen! Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.

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KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, ESCHEN WIRE
ROPE DIVISION, MOULDINGS DIVISION; and in Canada, Refractories, "Diaston" Tools, "Federal" Wires and Cables,
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#### CARVING A POWER PLANT OUT OF ROCK... continued

rock excavation of nearly four miles of twin conduit by an Edward Balf Co.-sponsored \$37.4-million joint venture with Savin Brothers and D. W. Winkelman, and a Gull Contracting Co.-sponsored \$29.9-million joint venture with L. G. DeFelice & Son. There, both contractors, working in twin trenches nearly 100 ft deep, present a showcase of fast-paced rock work.

3. The neatest job—that's what you call the 9,500,000-yd rock excavation being handled by Channel Constructors, a Peter Kiewit Sons'-sponsored \$40-milion joint venture with Perini Corp., Morrison-Knudsen, and Walsh Construction Co. Channel is carving out of solid rock an open canal leading from the conduits to a water storage reservoir, building the reservoir, and supplying crushed stone for all the contractors on the project. All through the operation you see evidence of smart early planning.

4. The classiest job — that's what you call the removal of 2,-500,000 yd of rock for a \$32-million pump-generating plant by Tuscarora Contractors, an Arundel Corp.-sponsored joint venture with L. E. Dixon Co. and the Hunkin-Conkey Construction Co. It's the only tag you can give the turns, returns, edges, ledges, and smooth walls carved almost with sculptured precision from solid rock.

5. The most awesome job—that's what you call the removal of 9,600,000 yd of rock by Merritt-Chapman & Scott Corp. for the \$98-million Niagara Generating Plant on the banks of the lower Niagara River in Lewiston. There, you see men and machines carving from a solid rock cliff huge penstock keys 150 ft high, tricky buttress cuts on each side of the keys, and a deep pit at the base of the cliff to form a seat for the generating plant's concrete draft tubes.

Reasons for classifying these jobs with the tags, toughest, cleanest, neatest, classiest, and most awesome, go beyond the purely aesthetic. The terms also describe the contractor methods for handling five rock jobs that have five different peculiarities. You see why when you examine each job in more detail.

continued on page 140



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SCALING THE ROOF of Chicago's 79th Street water tunnel... prior to setting 6" H crown arch ribs. During the construction of the \$7,852,000 tunnel, over 250,000 cubic yards of limestone are being burn cut, blasted and mucked from headings 164 feet below the surface. Over 4,700 feet of unstable ground requires reinforcement to prevent cave-ins...a situation further aggravated by the daily problem of pumping 1.3 million gallons of water. Despite these conditions, tunneling—including erection of support steel—progresses at a rate of 30 feet per 24 hours.

# Perfect Safety Recorded for Over 25 Years with COMMERCIAL Tunnel Supports



NEARLY A MILE of the 15 ft. 1 in. x 16 ft. horseshoe tunnel roof and walls are supported by COMMERCIAL arch ribs carried on double 8"I continuous wall beams supported by 6"H posts. Channel lagging bolted to the outside flange of the arch ribs serves as intermediate support between ribs. Threaded rods tie the ribs and posts on 4 ft. centers. All members are custom formed to fit the job and assembly into a unit structure. This is the COMMERCIAL tunnel support system.

For more complete details on how COMMERCIAL steel liner plate can simplify and speed up your vertical shaft, surface or sub-surface tunnel project—help make it safer—send today for your copy of Catalog 300-C1. Address: Commercial Shearing & Stamping Company, Dept. B-23 Youngstown 1, Ohio.



OUR BEST BUY—"For over 25 years we have used Com-MERCIAL tunnel supports. They have given us a perfect safety record," says W. A. LaVine, Assistant Project Engineer for S. A. Healy Company, the contractor. "We rely," he added, "on the broad experience offered by Commercial's engineers to aid us in the final choice of the proper weight and design of the members in tunnel support systems we erect—get a custom job on each project. On the basis of proven performance, experienced consultation service and just plain dollars-and-cents logic, our best source of supply for tunnel supports is COMMERCIAL SHEARING."

GOMMERGIAL shearing & stamping

#### CARVING A POWER PLANT OUT OF ROCK . . . continued



TRAFFIC SNARLS HURT-Many obstructions on intake job force off-highway trucks-with municipal permission—onto city streets.



SO DOES BRIDGEWORK-Conduit excavation moves ahead beneath one of many temporary bridges that will relocate roads.

## **Big Fleet Works in Small Spreads**



STILL WORK CONTINUES-Ingersoll-Rand four-tower Barmaster drill rig sends down line holes to get rock removal under way on a small stretch of twin, open-cut conduit.

WHY CALL the rock work on Merritt-Chapman & Scott's \$66million intake and conduit contract toughest?

You find some answers even before you step foot on the job. You see huge haul trucks loaded with rock rolling across city streets. They wait dutifully at traffic lights, patiently at railroad intersections while slow-moving freights pass.

You move onto the job and you see the problems. A series of small earth and rock cuts are scattered around an area criss-crossed by a maze of high voltage electric transmission lines, heavily traveled streets, railroad tracks, and a network of exposed gas, electric, sewer, and water lines. You wonder how the contractor can work

"Well." explains even-tem-

pered Edwin Pasha, project manager for MC&S, "we expected some of these problems when we took the job. But maybe not quite so many."

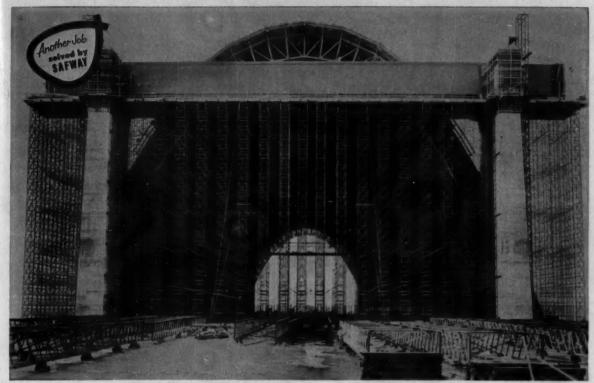
MC&S's contract calls for construction of two harmonicashaped concrete intake structures that will rise from the banks of the upper Niagara River, Included in the contract is the construction of the first 8,000 lin ft of twin. concrete-lined conduit that will start water coursing towards two generating plants. In the contract, too, is the relocation of all the obstructions in the work area.

Pasha explains that the work at the intakes area went easily enough. This involved throwing a cofferdam out into the river and unwatering an area that would permit constructing the intakes in the dry. The cofferdam consists of two 700-ft legs connected by a 2,000-ft wall. Relocation of seven industrial intakes slowed the work somewhat but caused no problems.

Troubles arose when work began on excavation of the two conduit trenches. MC&S originally had planned to divide the work into two separate operations. They were to: (1) complete all relocation of roads, tracks, and other obstructions, then (2) return and excavate the two trenches on 200-ft centers using the embankment between them as a continued on page 145

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50 Safway Steel Scaffold Towers Support 20 tons Each on Naval Aircraft Hangar Job

## How to Shore 500-ton Beams 120 ft. High

## 3,000 LB. LOAD IS SUPPORTED BY EACH STEEL SCAFFOLD LEG

NOT EVERY JOB calls for shoring two great 500-ton concrete beams at a height of 120 ft. But even when they do, you can solve the problem efficiently... and at lowest cost... with standard, portable steel Safway Scaffolding.

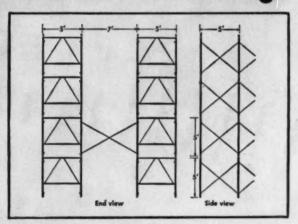
Beams for this giant U.S. Navy aircraft hangar were constructed quickly and safely, supported by 50 Safway Scaffold towers with a base area of 5 x 30 ft. each. The built-in strength of Safway frames plus engineered bracing made it possible for each tower to carry 20 tons. This amounts to almost 3,000 lbs. per leg supported 120 ft. high.

Adjusting screws at the top and bottom of each tower permit leveling the structure on uneven ground, and final setting of the formwork. They also simplify lowering and dismantling of the scaffolding when the job is finished.

#### 100% RECOVERY OF EQUIPMENT

Balanced Safway frames are easily handled by one man at any level. They go up rapidly to any height without a crane. Their capacity is definitely known. And when they are dismantled, you recapture 100% of your shoring equipment.

Safway scaffold engineers are available at any time to help you plan for both unusual and routine jobs. And you can always rely on your local Safway dealer to deliver an ample supply of Safway equipment... when and where needed...for purchase or rental!



Each of the 50 scaffold towers is 7 frames deep, spaced at 5ft. intervals. Additional bracing between towers unifies the structure, distributing shock loads evenly. Safway center-pivoted tubular steel cross braces square the shoring columns into rigid structural members.

CONSULT WITH SAFWAY—Shore all your jobs better—save construction costs! Submit details for Safway recommendations. And WRITE TODAY FOR BULLETIN 186





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the most profit!

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compared to other construction diesels. Coupled with this unequalled according is the ease of maintenance, dependability and long life that has made Cummins world famous. It's the power that earns the profits! There are more than 30 Cummins construction models from which to choose-70 to 600 horsepower. Each is specially designed for heavy construction usage. Leading equipment manufacturers make Cummins Diesels available in more than 400 construction machines of every size and type. Another reason why Cummins Diesels earn more profit is the excellence of the Cummins Distributor network. More than 350 locations throughout the U.S. and Canada offer genuine Cummins parts -skilled, efficient low cost service. Specify the power that earns more profit-

You can save as much as 50¢ per hour per unit with Cummins Diesels

Standardize on Cummins

# mezzanine "basement" and open floor areas achieved with space frames and shell roof of concrete!

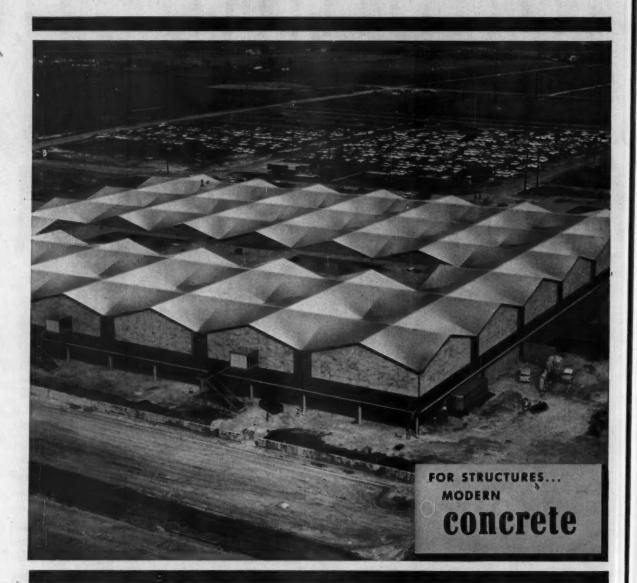
New ways of using concrete are bringing intriguing design possibilities to architects, with truly practical benefits for their clients. At Texas Instruments, Inc., Dallas, Texas, a trussing technique, using precast concrete V-tetrapods, made it possible to place some 36 special utilities in a walk-through mezzanine between floors. And concrete hyperbolic

paraboloids not only created an interesting roof line, but allowed flexibility for assembly line or plant expansion by providing great expanses of unobstructed floor space.

Architects: Richard S. Colley, Corpus Christi, Texas, O'Neil Ford, San Antonio, Texas. Associates: A. B. Swank, Dallas, Texas, S. B. Zisman, San Antonio, Texas.

#### PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete





# Hyperbolic paraboloid roof gives simple forming at low cost

Although hyperbolic paraboloids, used at the Texas Instruments plant, are curved in two directions, they can be formed without having to bend or curve lumber or reinforcement. Repeated use of forms give even greater economy.



## Concrete V-tetrapods create service area between floors

The prestressed, lightweight concrete ceiling slab and the second-floor slab are braced by 5,000 psi concrete diagonals, precast on the site. They were produced in pairs, joined in an inverted V. Two pairs were then interlocked to make four-legged braces (V-tetrapods). These were placed in position and anchored before top slab was placed.

For free literature on shell construction (distributed only in U. S. and Canada) write Portland Cement Association, Dept. A6-2, 33 West Grand Ave., Chicago 10, Illinois.

#### CARVING A POWER PLANT OUT OF ROCK ...

continued from page 140

haul'road. But things didn't work out that simply.

Many of the obstructions-for a variety of reasons-did not become available for relocation on schedule. The contractor then faced the choice of waiting for all of them to become ready before going ahead with excavation, or going ahead with the excavation piecemeal and relocating the obstructions as they became available. MC&S elected to go ahead. The decision upset some previous plans, most important of which was use of the embankment between the trenches as a haul road.

MC&S is throwing a number of temporary steel bridges over the conduit right-of-way to carry relocated roads, tracks, and utility lines. These divide the conduit excavation into nearly a dozen different small jobs. And that's how MC&S treats them — as a dozen different jobs.

Whenever a section of conduit is ready to be dug, the contractor moves in about 15 trucks and at least two shovels or draglines from its big equipment pool. Excavators mounted on the banks on either side of the trenches pull overburden and load it into trucks that haul it to storage piles provided by the Power Authority.

Haul requires the use of city streets. MC&S managed to get a zoning variance from the city of Niagara Falls, permitting it to operate off-highway vehicles on the streets. But some restrictions go with the variance; only seven trucks can move over city streets at any given hour; trucks can carry only half loads; and the trucks cannot operate between the hours of 7 and 9 am and 3:30 and 5:30 pm. These restrictions add to the problem.

Rock removal is a two-phase operation. After 30 ft of overburden has been removed, MC&S makes a cut about 50 ft wide to a depth of 10 ft below the rock surface to form a haunch. This will support a three-hinged concrete arch that will form the roof of the conduit. A second trench 45 ft wide then must be opened up to a depth of 66 ft below the rock surface to form the conduit.

To pull the first 10 ft of rock, MC&S drills 3½-in.-dia line holes along the trench walls on 9-in. centers with two Ingersoll-Rand Drillmasters at a rate of 40 ft per hr. Meanwhile, 10 Gardner-Denver Air Tracs sink 3½-in.-dia blast holes 10 ft deep on a 7x8-ft pattern. About 40 holes are drilled for a shot.

Most jobs on the project employ stationary compressors to supply air. Because MC&S operates the conduit excavation as several separate jobs portable compressors supply the air. These include five lingersoll-Rand 600 and 900-cfm rigs and 19 Gardner-Denver 600 and 900-cfm rigs.

The contractor loads the holes with from 6/10 to 1½-lb of powder for each yard of expected pull, depending on the type of rock. Powders include Olin-Mathieson and DuPont 40% gelatine and DuPont HiCap and Red Cross. DuPont electric blasting caps arranged in combined series and parallel circuits set off the charges in 1 to 6 delays to fracture about 300 yd of rock in sizes ranging from 1 to 3 ft.

Mucking is done from the outside embankments. Draglines reach down, scoop up the rock and load into haul trucks. At the haunch level, some shovels load into trucks that move out of the trenches over short ramps.

From the haunch level down to conduit invert nearly 100 ft below the surface, the same line and blast hole drill pattern is repeated, but the number of holes per shot is increased to 140 and depth of the holes is 20 ft. Powder loadings, too, remain the same as those above haunch level, but mucking then becomes solely dragline operation. Trench lengths are too short to permit building ramps and attempting to move trucks down to the excavation level, so shovels can't be used.

Keeping liaison between the short jobs are 24 pickup trucks, with General Electric two-way radios that deliver small tools, personnel, and supplies to each small spread.

Rock hauled to storage areas later will be used to backfill over the concreted conduits and as fill for a parkway that will run parallel to the Niagara River on the United States side.

Heading the job with Pasha is Tom Slattery, assistant project manager.

continued on next page

#### CARVING A POWER PLANT OUT OF ROCK...



HAULING ROCK—Euclid end dumps moves up steep ramp leading from conduit excavation. Trucks, loaded by shovels, haul rock to stockpiles.



DRILLING HOLES—Joy TDM Trac-Drills put down 20-ft-deep blast holes at 40 fph.

# Haul Trucks Run Up and Down Conduit Trench

SHOVELING BENCH — Working behind two Gardner-Denver rigs drilling 12 to 17-ft-deep blast holes, a Lima shovel loads fractured rock into an end dump truck.



WHY CALL the excavation for the next four miles of conduit the cleanest?

You decide clean is all you can call the work as you move up from the troublesome Merritt-Chapman & Scott intake job to the 9,500,000-yd rock excavation being done by Balf-Savin-Winkelman and Gull-DeFelice. The jobs represent sheer rock-moving efficiency, though conduit specifications are identical to those on the MC&S spread.

Work conditions are clean. The embankment between the parallel trenches is free for haul. Long lengths of conduit can be excavated with the most efficient use of shovels loading fractured rock into rear dumps that move rapidly up ramps over clearly defined haul roads between trenches to stockpile areas.

Drilling and blasting too, is clean. All operations are designed with assembly line methods that insure benching out of rock to the 100-ft-below-surface depths making maximum use of available drills and powders.

Balf-Savin-Winkelman, early in its job, mounted a Lima 2400 crane with a 6½-yd Esco dragline bucket on an embankment and removed the 30 ft of overburden, dumping into four and sometimes six Euclid 27-ton rear dumps that took the material to stockpiles. But once rock was bared, a fleet of drills went to work. These include 14 Joy Trac-Drills and four Gardner-Denver 124 Air Tracs.

Drills put 2½-in. dia line holes down to haunch level 12 to 17 ft deep on 1 to 2-ft centers along the four trench walls. The combine drills between 50 to 58 line holes to prepare for a shot. Drilling is done with 12-ft interchangeable steels tipped with Thompson carbide bits.

Balf-Savin-Winkelman loads

the line holes with string shots of Hercules 40% gelatine cartridges cut in 2-in. lengths and taped alternately to Primacord leads at varying intervals.

Meanwhile, 8 Joy TMM5 Challengers and 4 Joy 400 wagon drills send down 12 to 15-ft-deep, 2¼ to 3-in.-dia holes on a 6x8-ft blast pattern between the line holes. Some 95 holes per shot are drilled with Atlas Copco 3-in. carbide bits and Thompson 2¼-in. tungsten carbide bits at a rate of 45 to 50 ft an hour per rig.

Air supply, too, is clean. Two Joy twin WN 224 stationary compressors set up in an embankment top compressor house each deliver 6,368 cfm of air through a series of 8-in. steel main lines that run parallel to the trenches and break off into staggered 6-in. secondary lines which, in turn, branch off into 4-in. laterals leading to the drill spread.

Blast holes are loaded with an

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#### CARVING A POWER PLANT OUT OF ROCK ... continued

average of 0.85 lb of powder for each planned yard of pull. Powders include Hercules 40% Extra Gel, Hercules Gelamite No. 2, and Hercules 40% Extra. Cartridges are loaded solidly to within 5½ to 6 ft of the hole collar, and holes then are stemmed with ¼-in. screenings.

The load is connected in combined series and parallel circuits, and the charge is detonated in 1 to 8 delays, pulling about 1,500 yd of 12-in. rock per shot.

Two Lima 2400's with 6-yd dippers, a Lima 1601 with a 4-yd dipper, and a Bucyrus-Erie with a 3½-yd dipper work at bench level, loading fractured rock into 27-ton Euclid end dumps that haul material up ramps to stock piles.

The contractor averages four to five shots in a two-shift day. Shots are detonated anytime they are ready.

Below haunch level the blasting technique changes little. Line holes are drilled on a 1 to 3-ft spacing to depths of 12 to 18 ft. But, working deep, the contract-



LOADING HOLES—Workmen tamp down charegs of string shot in line holes drilled along conduit wall alongside steel pipelines that carry compressed air and water.



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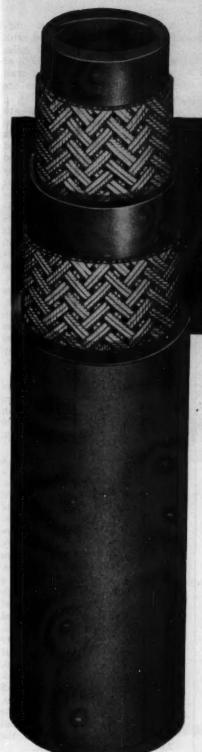
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Page 148—CONSTRUCTION METHODS and Equipment—June 1959



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#### CARVING A POWER PLANT OUT OF ROCK ... continued

ors go for higher production. They increase the number of line holes from an average of 58 per shot to 116 per shot. The holes are loaded with string shot.

The blast pattern remains the same as above the haunch, but the contractor, at the greater depth, takes a small production loss in order to break the rock into an easily manageable 6-in. average size.

Dave Stinson, project manager, heads the work for this venture assisted by Eugene Henry, general superintendent, Nick Dellavecchia, excavation superintendent, Jim Blinn, project engineer, and Joe Whitelaw, office engineer.

Right up the line, Gull-De-Felice operates what should, for all practical purposes, be a similar operation. But it differs.

To remove rock to haunch level, the combine has four Ingersoll-Rand Crawl-IR punching 2½-in.-dia line holes on 24-in. centers 30 ft deep along trench

walls. Holes drilled with different length steels tipped with Timken carbide bits. Line holes each are given a 3-lb charge of powder to insure a clean wall break. About 60 line holes are drilled for a shot.

Blast holes for benches are sent down on an 8 x 9-ft pattern 30 ft deep and 2½ to 4 in. in dia with 10 Joy Challengers fitted with varying length steels tipped with Timken carbide bits. They work at a rate of 90 ft an hr per rig. Three Joy 2,400-cfm stationary compressors, two Ingersoll-Rand 900-cfm and Three Ingersoll-Rand 600-cfm portable rigs supply air through an 8-in. main line that branches into 6-in. secondary lines bull-nosed to feed air to drills through 3-in. hose.

The combine loads blast holes with 0.95 lb of 40% gel and 40% dynamite in solid loads to within 6 ft of the hole collars. Holes are stemmed with ½-in. crushed stone. While working in heavy seams and around cap rock cartridge loadings are staggered.

DuPont, Atlas, and Hercules electric blasting caps, connected in series, detonate the charge in 1 to 9 delays to pull from 2,000 to 6,000 yd of rock in 10 to 20-in. sizes.

A Bucyrus-Erie 88-B with a 4-yd dipper and a 71-B with a 3-yd dipper work at bench levels, loading fractured rock into 15-yd Euclid rear dumps that haul the material up ramps to stockpile. The contractor averages five shots a two-shift day. Shots are timed to go off between 3:30 pm and 4:00 pm during shift changes.

Blasting procedure changes a bit for rock work below haunch level. Two Ingersoll-Rand 4-steel Barmaster drills are substituted for the four Crawl-IR drills. These send down line holes 22 to 30 ft deep on 24-in. centers, four holes at a time. The blast pattern, however, because of harder rock encountered, is reduced to 6x8 ft. However, the number of holes, depth, and diameter remain the same as above haunch level. But yardage pulled remains at the 2,000 to 6,000 yd per shot.

Heading the job for the joint venture is Fred Sebastian, project manager, with Joseph DeLucia, general superintendent, S. Sebastian, excavation superintendent, W. Morrison, rock superintendent, and G. Walls, assistant rock superintendent.

# Talk About Speed!

Only 12 man-hours to strip, move, set up and pour

Vix Construction Company, residential development, Englewood, Colorado



With just two men working, Warren Garrett, Denver concrete forming contractor, forms and pours a 37'8" x 23'0" residential basement foundation in twelve man-hours per working day...and not just once but consistently throughout many similar foundations!

Using Gates Horizontal Rod Forming System with 2' x 8' panels, Garrett places four rows of form ties in the wall and, to gain extra speed and economy, uses Gates re-usable Channel Top Ties at the top of the forms.

#### Here's a typical working schedule used by his crew in handling 121 lineal feet of forming:

6:30 A.M. Start cutting ties preparatory to stripping forms from previously poured foundation.

7:55 A.M. Forms and equipment have been moved and corner panels are set and braced in place on the footing.

9:00 A.M. Outside forms have been completely erected and braced plumb and true. The inside form will "float" to eliminate unnecessary walering and stiffening.

11:10 A.M. All forming has now been completed, including placement of two rows of reinforcing bars and seven windows.

12:30 P.M. Twenty-two cubic yards of concrete have been placed. Forms and bracing are given a final check and job is complete.

Investigate the many ways Gates Forming Systems can lower your costs and keep quality high. Additional information plus technical assistance is available from your nearby Gates Dealer, or write direct.



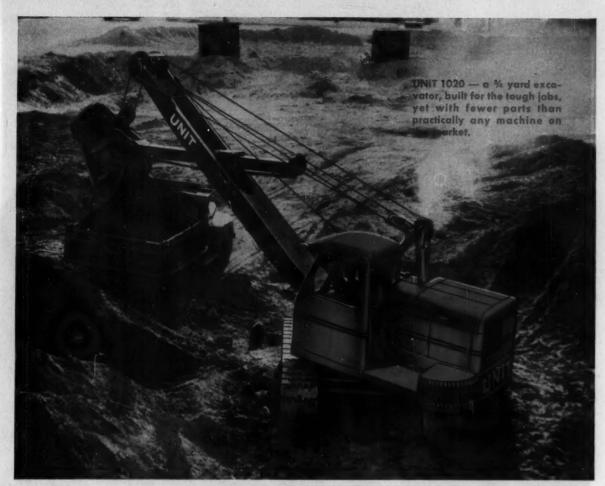
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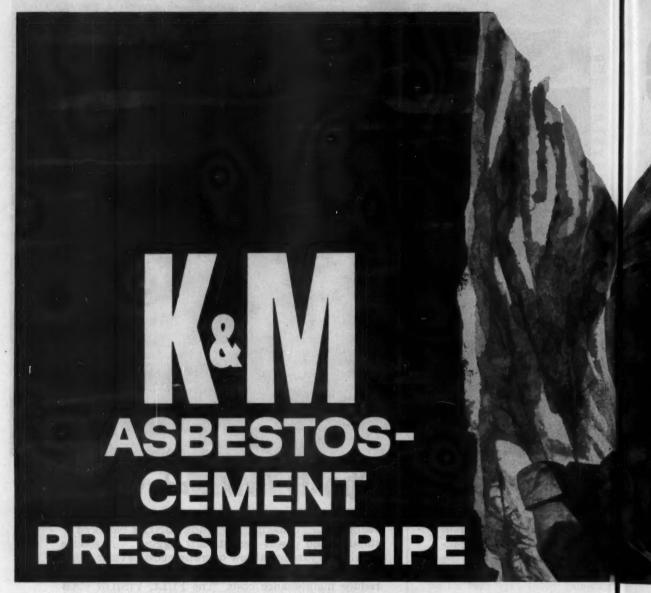
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Another engine in this class burns, according to pub-

lished claims of the manufacturer, .46 lb per bhp/hr - or 29% more. This means 3 extra gallons to every 10.

The Allis-Chalmers 21000 and companion 16000 (naturally aspirated) engines deliver superior performance because of superior, advanced engineering—at least two full years ahead. The famous Allis-Chalmers durability and lugability are still included, too — only more so. Let your nearby Allis-Chalmers dealer show you. Allis-Chalmers, Milwaukee 1, Wisconsin.

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# **Temporary Bridge Shortens Haul**

A Wisconsin roadbuilder with a lot of imagination built a 370-ft steel plate girder temporary bridge on a complex earthmoving job to reduce a long truck haul to a fast-moving scraper operation.

BUILDING a temporary bridge to carry earthmoving equipment is not an uncommon thing on highway construction jobs. But when the temporary bridge is a 370-ft-long steel plate girder structure supported on pile bents, you have to regard it as something of a phenomenon.

Ryan, Inc., of Janesville, Wis., built just such a bridge to haul earth from cut area to fill area on their \$960,000 contract to prepare the embankments for the Stadium Interchange in Milwaukee. The Interchange, which will form part of Milwaukee's new expressway system, is located beside Municipal Stadium, home of the Braves baseball team.

It's also located beside a river, a raliroad, and an assorted collection of city streets. All of this makes it a tough site for an earthmoving contractor to maneuver on.

Ryan's problem was that the nearest source of earth fill was extremely hard to get at from the interchange site. They did a lot of thinking about how to reach it economically and they came up with several imaginative ideas. Here's how Don Ryan, who was in charge of the job, describes the planning:

"We were faced with three alternatives to the problem of hauling 400,000 cu yd of roadway excavation from the cut on the east side of the Menomonee Valley to the Stadium Interchange enbankments west of the valley. Crossing the valley at grade was impossible because two mainline railroad tracks, six switch tracks, a river, and a city street separated cut from fill.

"The alternatives were: (a) Hauling with light trucks through city streets and across the valley on a viaduct—approximately a

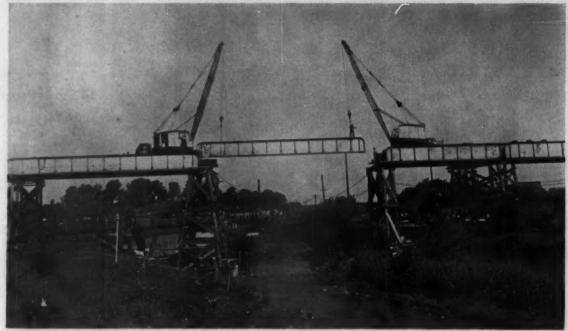
1½-mi haul; (b) erecting a conveyor across the valley, charging the conveyor with scrapers, and hauling from the conveyor to the embankments with off-theroad trucks; (c) erecting a bridge across the valley and utilizing scrapers for the operation.

"Our analysis of the economics of the alternatives determined that (a) and (c) were approximately equal. However we felt that (a) could result in a public relations problem.

"Transporting 400,000 cu yd in trucks would mean approximately 160,000 truck trips through city streets with its attendant dirt and dust. The haul route would be through heavy traffic.

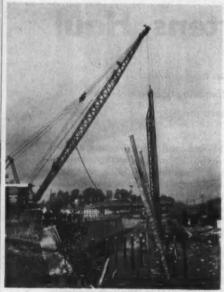
"Hauling across the bridge would be an operation completely within our control and would not affect city or baseball traffic. We decided on the bridge."

continued on next page



ERECTING THE GIRDERS—A pair of cranes places the girder that will close the last span of the bridge. Contractor built the

bridge for a three-month earthmoving job, dismantled it when job was finished. Steel came from old dismantled highway bridge.



DRIVING PILES—Crane, owned by subcontractor, drives river bent piles for temporary bridge to a penetration of 10 ft.

#### **Building the Bridge**

Having decided to build the bridge, Ryan turned the detailed work over to specialists. To start with, they engaged the engineering firm of Howard, Needles, Tammen & Bergendoff to design the structure. The design was governed by several factors. Most important was the fact that Ryan had obtained the steel from an old highway bridge that had been dismantled. They wanted to use this material for the temporary bridge. They wanted a bridge that would carry loaded 17-yd scrapers. And of course they wanted it located so that it wouldn't interfere with the railroad or highway traffic in the valley.

The engineers had to perform some fancy improvisations to meet all these requirements. But they were able to do it, and the result was a highly serviceable bridge.

The girders that Ryan had were 5 ft 8 in. deep. Some were 64 ft long; the rest were 66 ft long. This length determined the maximum lengths of the spans. In addition the piers had to fit in between the obstructions. The engineers ended up with six spans of 64, 66, 66, 66, 39, and 66 ft respectively.

To get the short 39-ft span they allowed two of the girders to overlap nearly half their length. The sections that overlapped were welded together with angles to prevent differential deflections.

The floor beams of the old bridge were 15-in. I-beams spaced at 5½-ft intervals. They were not strong enough to carry the calculated 27-ton axle loads of the 17-yd scrapers. So the engineers strengthened them by weld-8x½-in. cover plates on top and bottom.

Flooring was 8x16-in. timber. Ryan purchased this timber especially for the temporary bridge, but they will be able to reuse it for other purposes.

Curbs, made of 12x12-in. timber, protected the girders. The width between curbs was 14 ft; total clear width between girders was 18 ft.

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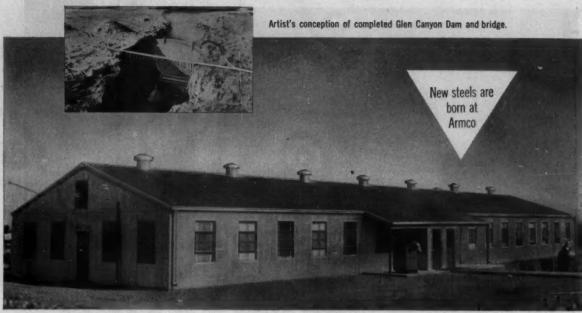
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The six spans of the bridge were carried on four pile bents on land, one bent in the river, and two pile-supported abutments. Bracing in the bents consisted of 4x8 and 3x12-in. timber.

The abutments contained 7 piles each. Land bents had 8 piles each and the river bent had 12 piles. The piles were timber with 14-in. minimum butt dia. Average penetration in the river was 10 ft; the land piles went down 15-20 ft.

The bridge height was designed to clear the railroad. To bring the land approaches up to the bridge level, Ryan built a 23-ft-high





It's hot, dusty and windy around this main office and administration building of Merritt-Chapman & Scott at the Glen Canyon Dam. But this Armco Building has all the modern conveniences and interior finish to make it comfortable and attractive.

## HOW GLEN CANYON CONTRACTOR USES ARMCO STEEL BUILDINGS

Merritt-Chapman & Scott Corporation, New York, prime contractor for the Bureau of Reclamation's \$108,000,000 Glen Canyon Dam in northern Arizona, has many Armco Steel Buildings at this construction site.

One interesting application is that of an L-shaped administration building, providing 9,000 square feet of office space. Because of frequent hot weather and dust-laden winds, the entire structure is air-conditioned.

Other Armco Buildings at this location include a power house structure, metals warehouse, tire storage and repair shop, and two twin-barracks for construction personnel—an additional 43,000 square feet of floor space.

At another big construction site—the Niagara Power Project in New York—Merritt-Chapman & Scott also has a number of Armco Buildings—some similar to those at Glen Canyon. These buildings, at both sites, were erected by Armco's Construction Department.

It will pay you to consider these buildings for your construction projects. Send coupon for free book on Armco Buildings. Armco Drainage & Metal Products, Inc., 7069 Curtis Street, Middletown, Ohio. In Canada: Guelph, Ontario.

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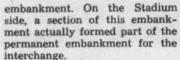
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#### TEMPORARY BRIDGE SHORTENS HAUL . . . continued



TRAFFIC CONTROL-Sign beside bridge instructs scraper drivers on speed limits and vehicle spacing. Man in cockpit in center of bridge (right) controls one-way traffic.



Various phases of the erection and dismantling of the bridge were handled by Edward E. Gillen Co., Price Erecting Co., and Mil-Wis Construction Inc., all of Milwaukee, and Janesville Con-struction Co. of Janesville.

#### Using the Bridge

Traffic control was necessary at all times while the bridge was in use because the roadway would permit only one-way traffic. Also the designer had specified that only one scraper should be on any one span at a time.

To handle the traffic, Ryan set up a cockpit in the center of the bridge and assigned a traffic director to it. The man had a large semaphore-type sign with STOP painted on one side and GO on the other.

As a final precaution, Ryan posted a large sign beside the bridge with the following instructions for scraper drivers:

- 16 mph speed limit
- · Keep 2 spans behind next scraper
- · Do not brake or accelerate

- · Obey flagman's signals
- Check steering mechanism daily

During the peak of the earthmoving operation Ryan had ten 17-yd Euclid scrapers hauling across the bridge. Average haul distance was 3,500 to 4,000 ft. Peak production was 130 oneway crossings per hr, or 11,000 cu yd per day. Because of noise ordinances, scraper operation was limited to one shift per day.

Ryan performed a useful job of landscaping at the same time as they obtained part of their borrow from the opposite side of the river. An irregular parcel of high land lay adjacent to the expressway right of way just east of the temporary bridge. This land formerly was on the right of way of an abandoned interurban railway.

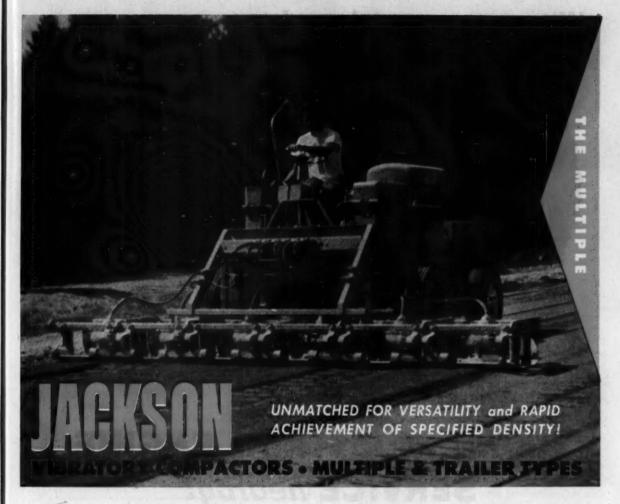
The cut for the expressway would have left this land 30 ft above the road and 60 ft above surrounding streets and houses. Ryan made an agreement with the owners of the land to lower it 60 ft, making an inaccessible piece of land into useful lots. At the same time they obtained the needed borrow.

The earthmoving phase of Ryan's contract lasted three months. After it was finished, they dismantled the bridge.

For the contractor, Don Ryan was in overall charge of the job and Jim Darrah was superintendent. For the Wisconsin State Highway Department, E. G. Plautz is district engineer for the Milwaukee Mtropolitan District. Leo Schuster was resident engineer on the job.



BORROW AREA-Scrapers obtain part of borrow material from abandoned railway embankment across river. Contractor ermoved embankment to leave usable building lots.



Each of the compactor units employed in the workheads of these machines supplies FORTY-TWO HUNDRED 6,000 lb. VIBRATORY BLOWS PER MINUTE and achieves maximum density of any granular material used in base courses and fills in the fastest possible time.

Each compactor unit may be operated independently and hence units may be detached from the maximum coverage arrangement of 6 units in the workhead (13', 3") to ideally fit each job; or they may be regrouped in a wide variety of tandem arrangements for more rapid densification of narrower areas. And in the case of the TRAILER COMPACTOR as many as eight compactor units may be employed in two workheads of 4 each—one in front and the other following the trailer.

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JACKSON TRAILER COMPACTOR — May be pushed or pulled by any prime mover capable of working speeds as low as 50 F.P.M. Towed to location at any road speed... operated in either direction... controlled by operator of prime mover. Power plant supplies both single and 3-phase 110-150 volt, 60-80 cycle A.C. and has many uses.

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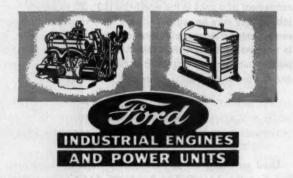
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Located everywhere from coast to coast, Ford Power Dealers offer prompt parts delivery and immediate on-the-job service to help you keep costly downtime at a minimum. Because each dealer carries a stock of normal replacement parts, you need never invest in a large parts inventory of your own. What's more, you get these parts at low cost because of Ford's modern production and distribution methods.

If you need a complete engine or power unit installation, check Ford's full line of dependable engines. These engines range from 134 to 534 cubic inches—including Ford's 220- and 330-cubic inch Diesels. And for really big jobs, there are three Super Heavy Duty V-8's—now available with 5- and

8-speed transmissions and the new 6-speed automatic transmission.

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# One Battle We're Losing -And Why

Lest it seem self-serving, we of McGraw-Hill, as publishers, have hesitated to make the following statement about the "Battle of the Books." However, our reticence has been overcome by our conviction that it is greatly in the national interest to have much wider public understanding of the nature of this battle. This conviction is strengthened by the fact that many, not in the publishing industry, believe in the importance of this battle and, further, by the fact that it is a battle which the United States is losing.

The United States is losing an important battle — a battle of knowledge and ideas, waged with books. It does not have the excitement of competition in scientific achievement, nor the urgency of a diplomatic crisis, nor the obvious economic significance of a struggle for export markets. But our success or failure in this battle of knowledge and ideas may well have a decisive bearing on these more spectacular aspects of international rivalry.

The Russians know this. About a decade ago, they started a program to build up their export of books, the most durable and penetrating way of communicating knowledge and ideas. By 1957 the Soviet Union was exporting 30 million books, one-and-a half times as many as the United States. Many of these books are printed in English, and all are in languages of the non-Communist world.

In the languages of the Near East alone, the Russians printed and distributed 413,600 books in 1957, as compared with 166,415 in 1956. In India, Russian textbooks on engineering are to be published in English under a technical aid agreement signed in Moscow last December.

#### "Trade Follows The Book"

Books are in the advance guard of the Soviet political and economic challenge to the free world. With books go ways of thinking — about government, about education, about management, about science and technology. If these books do their job effectively in the training of those who will become a nation's leaders, they will provide the basis for political and cultural understanding and also, in the future, for trade.

The Russians are not the first to discover this relationship. Britain, which lives by trade, has traditionally exported more of its book production than any other nation. Today it exports one book in every two produced. The British have a favorite dictum: "Trade follows the book." They have proved its accuracy. Now the Russians are trying to make this same principle serve their purposes.

Where does the United States stand in this competition for men's minds? In number of books, it trails far behind the Soviet Union — exporting roughly 20 million books, against the Russians' 30 million. As a proportion of our total output of books, our exports amount to only 10% — against Britain's 50%.

#### The Russians' Advantage

U.S. book exports have grown in the years since World War II, from approximately \$11,000,000 in 1946 to \$35,000,000 in 1958 (both figures excluding Canada). But in expanding book exports, the American publishing industry faces two major obstacles:

 The comparatively high cost of producing a book in the United States, which puts its price well beyond the reach of many students, teachers and businessmen in other countries; and

(2) The shortage of dollar exchange in many countries, which means that importers can pay for books only in currencies that are of little use to American publishers.

The Russians have neither of these problems. Soviet publishing is state-subsidized, and exported books are sold for nominal sums paid in the currencies of the importers. As these book serve the political and economic purposes of the Soviet Union, they are cheerfully sold on giveaway terms.

The American publishing industry, on its own, is making vigorous efforts to increase the distribution of American books in other countries. Leading U.S. publishers and their agents have offices and salesmen in the major countries of Asia, Africa and Latin America. Several publishers have begun to reprint textbooks in Asia at one-half to onethird of their U.S. costs, thus making them available to the students in Asian countries at prices they can more nearly afford. And the American paperback has become a symbol of low cost in popular books. But neither of these devices is practicable for serious cultural, technical, scientific, educational and professional books, which require durable, hard-bound and necessarily expensive editions. Despite their great importance to those who need these books, the demand for them is simply not large enough to warrant low-cost publishing methods.

Government agencies also have increased the availability of American books. The United States Information Agency and the International Cooperation Administration have placed American books in libraries overseas, donated them to educational institutions and presented them to key individuals in the industries and governments of the developing countries of the world. But these programs are small in relation to the need.

#### A Modest Program

An unusual and little-publicized Government program has helped American publishers overcome the other major obstacle to the export of books — the shortage of dollar exchange. This is the Informational Media Guaranty (IMG) program, administered by the United States Information Agency. It enables publishers of books judged to be worthy of the American way of life to sell their books, for local currency, in countries such as the Philippines, Formosa, Vietnam, Burma, Indonesia, Pakistan, Turkey, Israel, Poland, Yugoslavia, Spain and Chile, which would otherwise be unable to buy these books because of their shortage of U.S. dollar exchange.

The IMG program is not a giveaway. Publishers have to sell their books, and customers overseas have to want them enough to buy them at full prices. IMG merely guarantees that the exporting publisher receives in dollars the payments he collects from his customers in their currency. The program costs very little in

terms of our total foreign aid program, or in terms of what it accomplishes. In ten years it has made possible the sale of \$150 million worth of books, magazines and films to countries of key economic and strategic importance at a cost of only \$10 million.

The IMG functions through a revolving fund. Foreign currencies are exchanged for dollars, and the foreign currencies in turn are resold to replenish the supply of dollars. The net cost is the small but unavoidable loss on resale of these foreign currencies. Over the ten years of this program, the IMG revolving fund has shrunk from its original \$28 million to \$18 million, \$10 million of which is in unconverted foreign currencies.

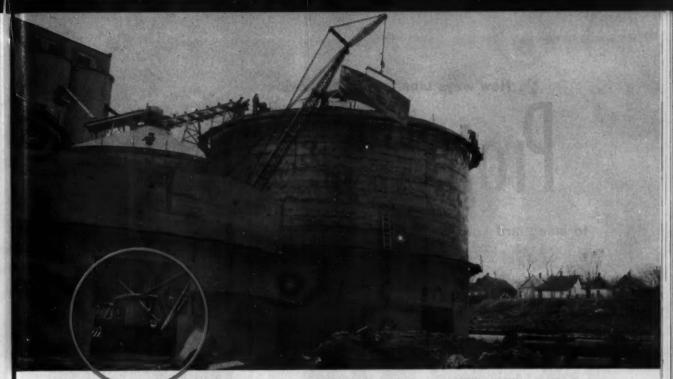
If this modest but vitally important program is to be continued, Congress must appropriate the money necessary to rebuild the revolving fund. This would ensure that any country approved by the State Department and willing to sign an agreement to buy American books, at their full price, with its own currency, could do so. Last August, Congress reduced a requested appropriation for this purpose from \$7 million to \$2½ million. To continue even at its present reduced level, an appropriation of \$3½ million is needed. To realize the full potential of IMG, the revolving fund must be restored to its original level.

If the IMG program is not continued, with adequate financial support, some countries whose friendship and understanding we seek today and with whom we hope to build a trading partnership in the future will have to reduce their purchases of American books to a trickle. These are countries where school teachers, college professors, students, engineers, doctors and businessmen need and want to buy American books. The loss will be not only theirs, but ours as well. For it will deprive the U.S. of one of its most effective, and least costly, means of communicating knowledge and ideas and understanding of the American way of life.

This message is presented by the McGraw-Hill Publishing Company to help increase public knowledge and understanding of an important national problem. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald CMcGraw

McGRAW-HILL PUBLISHING COMPANY, INC.



# Tight quarters . . . ticklish spotting job? You can do it with a NEW T-350 BANTAM





221 Park Street, Waverly, lowa
25 LARGEST PRODUCER OF TRUCK CRANE-EXCAVATORS

BANTAMS are the handiest rigs!

They are sized to be—with an amazing travel and work ease that hastens the trip, hurries the job. And now, with the all-new BANTAM T-350, you get stepped-up performance and ability to profit from full 11-ton capacity... to handle more and bigger jobs than ever before.

#### Practical size, biggest capacity

For example, here a new BANTAM T-350 with 65' boom and 15' jib works inside a partially completed steel storage bin to speed the construction of an adjacent bin. The BANTAM simply "drove right in and went to work"—handling the large steel plates with ease, and spotting accurately with BANTAM's precision-touch mechanical controls, inch-at-a-time power load lowering and safe, accurate power lowering boom hoist (optional).

You'll be money ahead with a new BANTAM T-350, whether it's heavy-duty crane work or any assignment where BANTAM's famed 11 fast-change attachments can speed the job. Choose from the industry's widest choice of equipment options—including four BANTAMbuilt carriers . . . increased gasoline, diesel or LP-gas power . . . torque con-

verter . . . three different boom hoists . . . house-type or all-vision cab.

All-New, too, BANTAM C-350
America's most modern crawler—with highest earnings for its size. Check BANTAM C-350's surprising work speed and ease. Full-reversing, 2-speed transmission and digging lock with incab control are standard. Digs to 18'10" with new, optional long-boom back hoe. New, hydraulically actuated back-hoe bucket (shown) rushes toughest digging jobs. Capacity to 8 tons. Also see new BANTAM CR-350 self-propelled—versatile contractor's tool for digging, lifting, handling, stockpiling jobs. 11-ton capacity.



ee how you can earn more
with a versatile NEW 350 BANTAM

MAIL THIS COUPON NOW

Schield Bantam Co., 221 Park	St., Waverly, Iowa	CM-239A
☐ Please have BANTAM Distrib	outor call me.	
Send catalogs on: T-350 B	ANTAM, C-350, CR-350.	
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Company		
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City	Zone State	

New ways Liberty Mutual provides

# Protection in depth

to safeguard your people... to cut workmen's compensation insurance costs

The best way for a contractor to cut his compensation insurance costs, without sacrificing any of the protection his business needs, is to start right now to cut down on accidents. To help you in this job, Liberty Mutual can make available a broad range of extra skills and resources.

This is Liberty's protection in depth. It includes a trained force of field engineers...two rehabilitation centers...1,300 claimsmen... an 86-acre Research Center. These, plus all our other protection-indepth services, are backed by the financial strength of the largest writer of compensation insurance.

Protection in depth has helped hundreds of construction policyholders save money through reduced compensation rates. And it has helped Liberty return more than \$491 million in dividends. You can buy this protection in depth only from Liberty Mutual. Write or phone our nearest branch office for full details.

Look for more from

# LIBERTY MUTUAL

...the company that stands by you



LIBERTY MUTUAL INSURANCE COMPANY - LIBERTY MUTUAL FIRE INSURANCE COMPANY - HOME OFFICE: BOSTON
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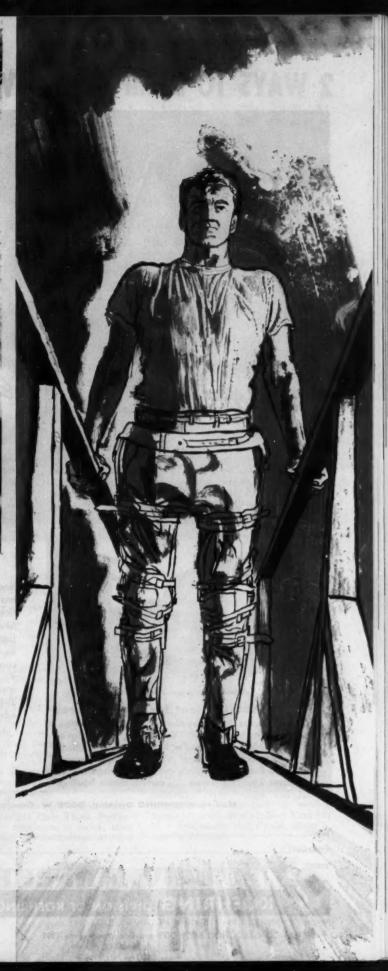
Accident victim gets quick help. If there's an accident on your job, a Liberty claimsman makes sure that proper medical care is available. Where large projects require it, one of these men lives right on the job. This fast, thorough claims service has helped hundreds of construction policyholders cut compensation costs.

#### Right

Severely injured employees of policyholders can make use of Liberty's rehabilitation centers in Boston and Chicago. Here, through therapy and prosthetics, patients help themselves recover and return to productive work. Types of injuries treated include bad fractures, amputations, torn muscles and back injuries.

#### Left

Dynamite under control. To protect buildings from blast damage, Liberty's engineers developed a ground-vibration recording instrument that tells how much dynamite can safely be used in a particular locale. The "accelerograph," as it is called, has helped cut insurance costs on such jobs as the New York Thruway and the Massachusetts Turnpike.



# 2 WAYS TO DUMP with NEW 10-yard Dumptor..



Instantaneous gravity dump

During a full-controlled dump cycle, hydraulic system acts as a retarder. Gravity actually tilts the body . . . hydraulic pressure controls the rate of discharge when dumping into hoppers, "spreading" or distributing load along a fill, Kick-out pan breaks load suction when dumping sticky materials.

Any time quick dumping action is needed, operator releases fast by-pass of fluid in hydraulic cylinders... gravity takes over... dumps load instantly. Hydraulic cylinders check body-tilt at 65° angle... and have the same cushioning action when dump body is returned to normal hauling position.



A recent addition to the Koehring® line, this big 10-yard Model 100 Dumptor® has 30,000-pound payload capacity. In addition to unique dual dumping advantage, and new two-way controls for no-turn shuttle hauling, you also get: speeds up to 20.8 m.p.h. in either direction • speed-range selections controlled by easy-acting hydraulic clutches constant-mesh transmission with smooth torque-converter drive • easy power steering • 281/2% gradability, and many more outstanding advantages for low-cost, heavy-duty hauling.

> 2 SIZES — Koehring also builds a smaller, companion-model 6-yard Dumptor. Both sizes offer cost-cutting advantages you can't af-ford to miss. Why wait? Call Koehring distributor today, or write for more information.

Mail to: KOEHRING Division, 3026 W. Concordia, Milwaukee 16, Wisconsin

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KOEHRING DIVISION OF KOEHRING COMPANY . Milwaukee 16, Wis.

# How to select the right friction material for the right spot to cut maintenance costs

Over 50% of all premature failures in relined brakes and clutches are caused by the improper selection of friction material for the machine's requirements.

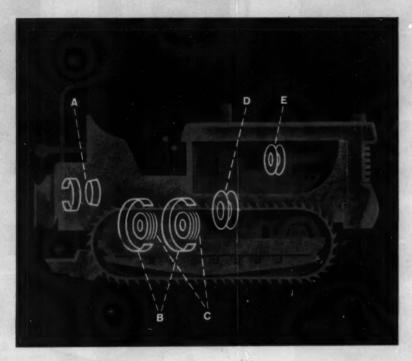
Working closely with machine operators, J-M Friction Engineers have developed a wealth of knowledge and data, which can help you extend the period between overhauls and at the same time step up the power and efficiency of your equipment.

Here is a diagrammatic sketch of latest recommendations on the selection of friction materials for a typical crawler tractor . . . this information is based on the wide, practical experience of countless operators.

Johns-Manville Friction Materials, factory equipment on many machines, offer the most complete range of styles in the field. They can fulfill the friction material needs of any piece of equipment in any service. J-M Moulded Asbestos Frictions, particularly well-suited where heavy shock loads tend to crush or shear materials, give long life in hardest use. For those who prefer woven frictions, J-M Woven Asbestos Roll stock, in a variety of styles, seats quickly, will not score, and has great mechanical strength.



Woven J-M Cone Facing being applied to a power take-off unit.



## Easy guide to proper friction selection:

- A. Power Take-Off receives sudden shock loads, intermittent loading.
  - —Cone clutch—Style 510 for easy seating. Style 304 for those operating in oil.
  - -Brake Lining-Style 240 for good wear and friction stability.
- B. Steering Brakes subject to erratic engagement and extreme wear.
  - —Style 240 for light-duty tractors . . . Style 140 for heavy-duty tractors for high quality and excellent wear characteristics.
- C. Steering Clutch Discs exposed to high energy loading with shock, slippage and heat.
  - —Style 140 straight clutch facing . . . Style 141 Gear Tooth Facing, for their resistance to shock, heat dissipation, low-fade characteristics

- and Style 141's high tooth impact strength.
- D. Master or Engine Clutch exposed to constant high energy loading.
  - —Style 751 for light-duty tractors for good wear and engagement characteristics and Style 140 for heavyduty tractors.
- E. Starting Engine Clutch needs positive, non-slip, non-grabbing friction.
  - —Style 751 because of excellent cushioning action and engagement characteristics.

The assistance of a friction materials specialist to help you select your requirements is available through your Johns-Manville Distributor. Your own copy of the J-M Industrial Friction Materials book, listing all friction materials' types, styles and recommendations can be had by writing Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario. Ask for FM-35A.

# JOHNS-MANVILLE



Great new things are shaping up in concrete block Cement

Exciting new masonry walls, exterior or interior, are made possible with decorative masonry units now available from concrete block manufacturers. For example, this unusual masonry wall was created by Architect Victor Lundy of Sarasota, Florida, for showing at Cleveland meeting of National Concrete Masonry Association. The block was produced by Shaffer Block Works, Somerset, Pa.

#### Atlas Masonry Cement measures up to the new masonry

providing the right mortar for laying up walls with the latest block designs. It produces a smooth, easy-to-work mortar that "butters" easily, stays workable, assures a stronger bond. These characteristics help to achieve weather-tight masonry joints that are uniform in color. And Atlas

Masonry Cement fully complies with ASTM and Federal Specifications. For your copy of "Build Better Masonry," write Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.



Universal Atlas Cement Division of United States Steel

M-75

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## Construction Men in the News...



MANSELL L. MACLEAN, president of MacLean-Grove & Co., is the new president of The Moles, an association of heavy construction engineers and executives. He succeeds Howard A. Collins, president of the Howard Collins Construction Co.

Other new officers include: Chester W. Cambell of The Foun-

#### The Moles Elect a New President

dation Co., first vice president; Harry T. Immerman of Spencer, White & Prentis, second vice president; Eugene G. Rau of J. Rich Steers, Inc., treasurer; Eugene F. Moran, Jr., of Moran Towing Corp., secretary; and Robert S. Mayo of the Mayo Tunnel & Mine Equipment Co., sergeant-at-arms.

Four men elected to three-year trusteeships are: George F. Ferris of Raymond International; M. C. McGough of Merritt-Chapman & Scott Corp.; Charles B. Molineaux of The Arthur A. Johnson Corp.; and John J. Walsh of Walsh Construction Co.

The new Moles president was born in Canada and came to the United States to start his construction career in 1924 as a field engineer with Gibbs & Hill on railroad electrification and power plant construction in Virginia and New York. In 1926 he became field engineer for Rosoff Subway Construction Co. on construction of the Eighth Avenue subway in New York City. Rosoff, in 1929, promoted him to assistant engi-

neer and estimator for all subway construction.

MacLean remained with Rosoff until 1937 when he joined Park Contracting Corp. as assistant chief engineer for construction of several difficult subway jobs in New York City. In 1939 he joined Samuel R. Rosoff, Ltd., and supervised construction of 15 mi of deep rock tunnel for the New York City Board of Water Supply.

He became project manager in 1940 for Rosoff Panama Construction Co. on construction of the New Gatun Locks in the Panama Canal. MacLean headed all phases of the \$46-million contract including final negotiations with the U.S. government when World War II terminated construction.

In 1951 he teamed with Philip Grove, also a Mole, to form the company he now heads. MacLean-Grove has constructed deep underground liquid petroleum storage facilities in Illinois and, in cooperation with two other companies, it served as sponsor on the recently completed Third Tube of the Lincoln Tunnel.

#### Merritt-Chapman & Scott



JOSEPH S. MYERS (left) and HARRY W. POWELL are new vice presidents of Merritt-Chapman & Scott Corp.

Myers, formerly an assistant vice president, was named a vice president for Merritt's construction department. He will be responsible for overseas development and will report to William



Denny, executive vice president in charge of the construction department.

Myers has been with the organization for 13 years and has served since 1957 as assistant vice president. He is a specialist in marine and heavy engineering and construction.

Powell, also a former assistant

vice president, will be responsible for purchasing for the company's construction department, marine salvage division, and derrick division. He will report to Herman B. Block, executive vice president for procurement.

Powell joined the organization in 1950 as a member of the construction department's purchasing staff and, since 1955, has served as director of purchasing for the department. He was elected an assistant vice president in 1957.

#### Whiting-Turner

HAROLD P. COHN and RALPH P. PASS become vice presidents of The Whiting-Turner Contracting Co. of Baltimore.

Cohn came with Whiting-Turner in 1947 and became a division manager in 1954. Pass came to the organization in 1947 and became midwestern division manager in 1955.

continued on next page

#### BUILT-IN RUST PROTECTION



Blue Brute Air Tools give you a big money-saving feature—they resist rust and corrosion. The reason is an exclusive process: Blu-Coated Parts.

With Blu-Coated Parts Worthington Air Tools operate better job after job and in damp atmosphere. They resist wear, seizing, galling. They hold oil better. Even after your toughest jobs you can store them for months with-

out deterioration.

Blu-Coated and Worthington Distributor's Guaranteed Availability Plan keep your jobs going even if your tools are in for checkup or repair. GAP works this way: 1) bring in your Blue Brute tool for repair. While it's in distributor's hands he will, 2) lend you an air tool to keep your job going. See him for complete details, about Blu-Coated, GAP, and assured parts and replacements. 60-15



GARDEN KING POWER SPRAYERS

15 & 30 GAL. CAPACITY



For spraying silicon water repellents for man cement work and many other spraying purposes. Briggs and Stratton Motor, Disc wheels, Agitator keeps spray solution mixed. Very high quality. Built for hard wage. Send for circular.

DRINKING WATER and SUPPLY TANK

Replaces unsenitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. ular. Send for eircular



D. B. SMITH & COMPANY ice for Quality the World Ove



TROUBLE-FREE STEAM CLEANER

The Turbo Steam Cleaner is made for continuous rough service. It takes care of continuous rough service. It takes care of all cleaning, degreasing, paint-stripping and phosphatizing jobs faster, better and cheaper than any other steam cleaner. Quickly pays for itself: Low fuel consumption; detergent savings; low maintenance. Simple construction. Many automatic safety features. Nothing automatic safety features. Nothing cleans like steam and no steam cleaner cleans like a Turbo. Oil-fired and electric models. Send for illustrated folder.

# STEAM CLEANERS



TURBO MACHINE COMPANY LANSDALE, PA.

MEN IN THE NEWS . . . continued

#### **Foundation Contractor**

HARRY SCHNABEL, JR., has organized Schnabel Foundation Co., a firm that will specialize in underpinning and excavation, sheeting and bracing. The firm's offices will be in Washington, D. C.

Schnabel has worked on the foundation design and construction of many Washington buildings. Among them are the new Smithsonian Institution, the headquarters for the AFL-CIO, and the National Grange building.

Outside of Washington, he worked on the State Roads Commission Building in Baltimore, the Miller and Rhoads department store in Richmond, and the office building for the Hampton Roads Sanitation District Commission in Norfolk.

#### Dravo

KENNETH C. COX is a new vice president of Dravo of Canada, Ltd. He has been with Dravo Corp. of Pittsburgh in various engineering capacities for more than 13 years. In 1953, Dravo sent him to Toronto to become general manager of the then organizing Canadian firm.

#### Leonard

MARVIN R. PAULLUS is the new president of Leonard Construction Co. He replaces C. F. Keife, who resigned as president but remains with the company as a consultant. R. A. Peters, formerly construction manager, becomes executive vice president.

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#### **U.S. Steel**

FIVE NEW contracting managers have been named by United States Steel Corp. Their names and their areas are J. H. Long, eastern area, New York City; D. J. Morfee, central area, Pittsburgh; P. J. Larson, midwest area, Chicago; Walter Schielke, southern area, Houston, and J. C. Hamilton, western area, Los An-

#### Corps of Engineers

COL. WOODROW W. WILSON will become district engineer for the Army's Corps of Engineers at Detroit, Mich., in July. He is now stationed in Europe.



10th Lorain for T. W. Kidd speeds moving 80,000 yards of rock on \$1,800,000 flood control dam at Oxford, Mass., for the Corps of Engineers. The 85-A digs ledge cuts ranging from 10' to 40' deep, 20' to 60' wide and 1000' to 2500' long for spiliways and diversion channels.

# ROCK-STEADY SWING ONE REASON FOR STEADY ROCK PRODUCTION OF LORAIN 85-A

The single ball race, Shear-Ball turntable mounting of this 2½-yard Lorain 85-A shovel is one of the reasons T. W. Kidd, Jr., of Fall River, Massachusetts, says, "Finest rock machine I have ever owned... rugged efficiency with real economy."

Shear-Ball mounting provides a smooth, rock-steady swing, reduces downtime for maintenance and frequent lubrication common to roller type design. Trouble free operation keeps the Lorain 85-A on the move to pile up high production regardless how tough the digging.

This exclusive Lorain feature has been proven in nine years of field service throughout the world. You can have this important advantage on your rock shovel too. See your Lorain distributor for full details and a demonstration.



Lorain Shear-Ball turntable mounting. 69 hardened high-alloy chrome steel balls carry the load as they revolve freely on sealed, precision-ground, and hardened races. The balls lock the turntable to the mounting so no center pin, nut, centering gudgeon, or any type of turntable roller or exposed roller path is needed. All the adjustment, maintenance and lubrication problems of this type of design are eliminated.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

# LORAIN° ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio

PRODUCTS—Power shovels, cranes, draglines, clamshells and hoes on crawler mountings from %- to 2½-yard capacity. Cranes from 7 to 80 tons...on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes. Rubber tire frontend Moto-Loaders in 1%- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.



# JOB RECORDS PROVE

Firestones lower tire costs-per-hour!

Firestone off-the-highway tires cut costs by working extra hours on the roughest jobs! That's because they're built with Firestone Rubber-X, the longest wearing rubber ever used in Firestone tires. Tough Firestone treads and sidewalls defy cuts from rubble and shale. Exclusive Firestone S/F (Shock-Fortified) nylon bodies shrug off bruising shock and impact. There's a Firestone tread and tire design that is job-engineered for your job requirements. Call your Firestone Dealer or Store and ask about Firestone's full line of tubeless or tubed off-the-highway tires and on-the-job tire service.



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When ordering new equipment always specify Firestone tires—available tubeless or tubed.



Copyright 1959, The Firestone Tire & Rubber Company

## Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

#### **Distributor Appointments**

Yale & Towne Mfg. Corp.: The following six distributors have been appointed to handle the Trojan tractor shovel line: The Road Machinery Co. of Phoenix, Ariz.; The Connell Motor Truck Co. of Stockton, Calif.; The Macdonald Equipment Co. of Denver, Colo.; The Nixon Machinery & Supply Co. of Chattanooga, Tenn.; The Manitou Equipment Co. of Portland, Ore.; and The Century White Truck Co., Inc., of Casper, Wy.

Diamond T Motor Truck Co.: The following five distributors have been appointed: Idaho Equipment Co. of Twin Falls, Idaho; Motor Equipment Co. of San Antonio, Tex.; Paducah Truck Sales of Paducah, Ky.; Ceranski Bus & Truck Sales of Schofield, Wis.; and J. R. Broek, Inc., of Manchester, N. H.

Highway Equipment Co.: The following five distributors have been appointed: Hillsman Equipment Co. of Melrose Park, Ill.; McElroy-Roland Machinery Co. of Springfield, Ill.; Road Equipment Co. of New Orleans, La.; Carolina Equipment & Parts Co. of Columbia, S.C.; and Seabrook Machinery, Inc., of Tallahassee, Fla.

Bucyrus-Erie Co.: The following four new distributors have been appointed: Gill Drilling Equipment Co. of North Branford, Conn.; Lake Shore, Inc., Service & Supply Division of Iron Mountain, Mich.; Valley Materials Handling, Inc. of Knoxville, Tenn.; and Mussens Canada Limited of Montreal, Canada.

Clark Equipment Co.: The Construction Machinery Division has appointed Road Machinery & Supplies of Fargo, Inc., of Bismark, N. D., and Road Machinery & Supplies of Minneapolis, Inc., of Duluth, Minn., to sell and service the "Michigan" line of con-



Main Office: 816-838 LIBERTY AVENUE, BROOKLYN 8, N. Y.

Plants & Sales Offices: Atlanta, Georgia; Fort Worth, Texas; St. Joseph,

Missouri. In Canada: ACROW-RICHMOND LTD., Orangeville, Ontario.

INSIST ON RICHMOND .

SCREW ANCHOR CO...INC

AND BE SURE IT'S RICHMOND

for help on a specific

problem - write to:



#### "CARCO WINCH'S DEPENDABLE PULLING POWER IS IMPORTANT IN LAYING PIPE"

Reports John Wall of Berry Construction Co.

Carco winches were important and necessary equipment to subcontractor Berry Construction Co., of New Hebron, Miss., in laying 130 miles of the Carolina Pipeline Company's new line across northeastern South Carolina.

Three Carco model F winches mounted on Allis-Chalmers HD9 tractors were continually called upon to tow heavy equipment through swampy and muddy terrain. The value of the pulling power of Carco winches to the contractor is evident from the fact that about half the line was laid in swampy areas and half in mud.

Mr. John Wall, General Superintendent, reports, "It would have been difficult, if not impossible, to lay pipe profitably in the terrain we encountered without Carco winches. We are most favorably impressed with Carco winch dependability and pulling power as well as their minimum need for maintenance.'

Carco makes more winches for more makes and models of industrial tractors than any other producer. That's conclusive proof that Carco winches are engineered to perform efficiently and are built to withstand the rugged service that contractors give them. See your Carco dealer for the line pulls, cable capacities and other pertinent facts on the eight Carco winch models. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.

# SPECIFICATIONS CARCO F WINCH able Drum Sixes Barrel diameter Flange diameter 1,685 lbs.

#### FEATURES . CARCO F WINCH

- **Doubles tractor pulling**
- Power reverse to pay out

- nal over or underwind
- Concealed push-pull cable

- Heavy duty ball and
- tapered bearings Lubricated by continu
- oath oe roller fairlead extra

Many of the nation's leading contractors depend upon Carco for tractor winches. You, too, can expect greater value from the leading producer, and get it from Carco, first in tractor winch production.



#### SALES AND SERVICE ... continued

struction and bulk material handling equipment, machinery and supplies.

#### On the Sales Front

Hercules Powder Co.: The Explosives Department has appointed the following five assistant district managers: Robert E. Good, Chicago office; William D. Cashin, Joplin, Mo., office; Allen T. Keel, Birmingham, Ala., office; Robert F. Kelleher, Pittsburgh office; and Robert N. Whisenant, San Francisco office.

LeTourneau-Westinghouse Co.: L. B. "Phil" Philippi has been named to head a new Truck Sales Division that is being established by the company. He will make his headquarters in Terre Haute, Ind.

Symons Clamp & Mfg. Co.: James J. Cotter has joined the Jersey City office in a move to better handle the New York metropolitan area. Frank Fearon remains as sales representative in New York City.

Chain Belt Co.: The Construction Machinery Section has appointed Joseph L. Jarboe as district manager of its Rocky Mountain territory which includes the states of Utah, New Mexico, Colorado, Montana, and Arizona.

Motorola, Inc.: Robert F. Davis has been named manager, Two-Way Radio Sales of a 13-state Midwest area for Motorola Communications & Electronics, Inc., a sales and service subsidiary of Motorola, Inc. Eric Goleas replaces him as regional manager in northern Illinois, northeastern Indiana, eastern Wisconsin and Michigan's Upper Peninsula.

Colorado Fuel & Iron Corp.: Bert F. Rivers becomes Spokane district sales manager. He was assistant district sales manager at San Leandro, Calif. He will succeed Melvin L. Alter, who has been transferred to the New York office to become assistant director of sales, national accounts.

U. S. Steel Corp.: Boyd P. Doty, Jr., has been named general sales manager for Amercian Steel & Wire Division. He succeeds Howard B. Maguire who has retired.



# Pounded over 200 times by air hammer...still not cut!

Even after steady pounding with an air hammer, which delivered 80 pounds of pressure to the chisel edge, Gold Seal air hose was still intact! Think of how much you will save on costly replacements should your operator accidentally hammer Gold Seal for a few seconds... or a trucker dump a load of rock on it... or a tractor grinds over it.

A. COVER: Extremely tough, re-

silient rubber; resists abrasion, cutting and gouging.

B. CARCASS: Braided steel wire for maximum strength and resistance to extreme impacts. Single braid of nylon cord to insure maximum bonding of cover to carcass.

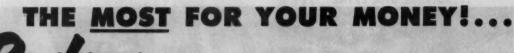
C. TUBE: Synthetic compound to insure maximum oil resistance. Won't soften or flake.

Won't soften or flake.
Write Dept. E. for more information.



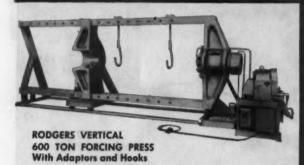
MANUPACTURING CORPORATION, TRENTON 3, N. J. Divisions: Acme Rubber Mfg. Co. • Hamilton Rubber Mfg. Corp.

ATLANTA . CHICAGO . DETROIT . HOUSTON . INDIANAPOLIS . LOS ANGELES MILWAUKEE . NEW YORK . PITTSBURGH . SALT LAKE CITY . SAN PRANCISCO . SEATTLE



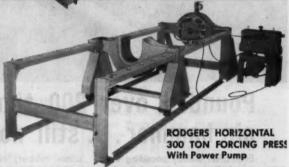
# Rodgets Forcing Presses

Greater Rugged Flexible Versatility Power Controls









When you buy a Rodgers Forcing Press, you are not tying up your money in a single purpose tool. Compared with other presses, Rodgers design permits a wider variety of jobs to be handled—from the full tonnage capacity of the press, on heavy duty work, to partial capacities required for light jobs.

Rodgers Press design also offers unique flexibility in the interchangeability of cylinders and power source. Each press can be easily modified to suit changing job requirements. And an "extra" feature is the simple way the cylinder and pump may be detached for jacking, pulling and pressing work in the shop or field. Rodgers positive, accurate controls may be used at the press or remote.

When you check Rodgers Forcing Presses, feature for feature, their rugged construction, fast, positive action, and the variety of adaptors, hooks and other accessories available, you will be convinced that a Rodgers will give you the *most* for your money.

Rodgers Forcing Presses are available in standard, horizontal, vertical, inclined and portable models... capacities from 100 to 600 tons... with power or hand pumps.

Write for Catalog No. 315A . . . it gives complete details and specifications.



RODGERS HYDRAULIC, Inc.

Pioneers in High Pressure Hydraulics Since 1932

# COMMENT

#### from the BUTLER ENGINEER

# Of a new baby's birth ... and Ready Mix on the Moon

A new baby is born and not only that, but is born in full maturity — completely adult and functioning well. It's the Concrete Plant Manufacturers Bureau of the National Ready Mixed Concrete Association. For short it's called CPMB. Remember it, for it will be of great importance to the Ready Mixed industry.

The CPMB is comprised of Butler Bin Co., and six other manufacturers of concrete plants.

The Bureau is counseled by Vince Ahearn, the highly respected Executive Secretary of the NCMA, and Ken Tobin has been made Executive Secretary of the CPMB.

The entire purpose is to set up approved designs, specifications and standards. Nomenclature too, is to be standardized, for this is an area which at times has been pretty cloudy. In other words, to obtain an exact definition of "automatic batcher, semi-automatic, manual" and many other technical terms.

The whole effort definitely redounds to the benefit of the producers of Ready Mixed Concrete.

Of great significance is the high degree of automation in Roadbuilders and Ready Mix Plants designed today. NOT very long ago an order for an automated plant was, as the booksellers say, "Excessively rare." Now an order for a manual plant makes everyone wonder what the Sam Hill it's to be used for.

Today we're momentarily expecting someone to say "Look, I'm in the market for a plant to batch concrete on the moon." Well, we haven't one quite as portable as that — yet — but we will when there's enough demand.

The Butler Engineer\_

BUTLER BIN COMPANY WAUKESHA, WISCONSIN

#### SALES AND SERVICE ...

continued

#### In the Main Office

The White Motor Co.: John C. Tooker has been named vice president of the company and general manager of the Reo Division. Noah O. Gresham has been named vice president of wholesale operations of White Truck Division.

Atlas Copco: Marcus Wallenberg has been elected chairman of the board of directors. He replaces Walter Wehtje, who has retired. Nils Vult von Steyern was elected deputy chairman and Marc Wallenberg, Jr., was elected to the board of directors.

#### Associations

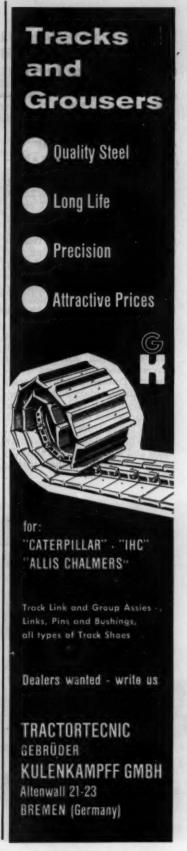
Asphalt Institute: Col. W. Dixon Smith, USA (ret.) has been named to the position of staff hydraulic engineer at College Park, Md. Clinton C. Gregory, of Pierre, S. D., has been named district engineer for North and South Dakota.

Portland Cement Association: Thomas E. Long has been named eastern regional manager in the New York City office. He succeeds Miley J. McMillan, who has been named senjor consultant in the Promotion Division. Joseph A. Leadabrand, former manager of the Soil-Cement Bureau, becomes assistant to the vice president for promotion.

#### **Special Mention**

Tretol, Inc.: Tretol is a new company that has been formed to manufacture and market a line of quality products for the concrete and masonry field. Administrative and Sales offices are located at 6531 West 63rd St., Chicago 38, Ill. Tretol, Inc. is American owned but has an arrangement with Tretol Limited, an English firm for the exchange and use of the latter's formulas and manufacturing techniques. Products include concrete surface treatments, concrete integral mixtures, and waterproofing formulations. Raymond Patterson has been appointed vice president and general manager of the new firm. .

Superior Concrete Accessories Co.: Eastern office is now located at 39-01 Main St., Flushing 44, N.Y. Martin Flaherty is manager of this office, which formerly was at 1775 Broadway, New York City.



## Construction Equipment News...

#### Self-Loading Hauler Also Works as Dozer

The Multi-Mover works as a bull-dozer or loads itself and carries and dumps its load as a dump truck. The machine weighs 22,000 lb. It has a capacity of 7 cu yd struck or 9 cu yd heaped. During the loading cycle a hydraulically powered claw repeatedly reaches out ahead of the machine and pulls bites of earth into the box. An ejection gate slides forward to push earth out during unloading. The Multi-Mover can unload itself while moving forward or backward or standing still.

A 167-hp Waukesha engine powers the unit. Other design features are an Allison torque converter and three-speed transmission, Timken Detroit steering axle with planetary hubs, a Garrison hydraulic power booster, and four-wheel hydraulic brakes. Speeds range from 1.5 mph to 35 mph. The ejection gate and claw arms and apron are hydraulically powered. — Idaho Manufacturing Co., Boise, Idaho.



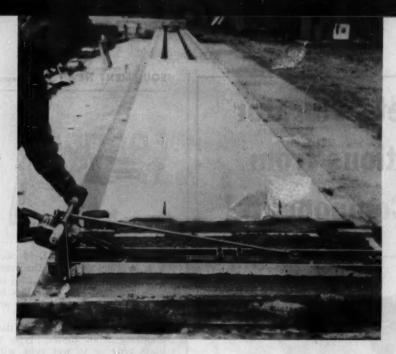
#### Corrugated Construction Reduces Body Deadweight

International's two rear dump Payhaulers carry payloads of 19 and 27 tons. Struck capacity of the model 65 Payhauler is 12.5 cu yd; the model 95 Payhauler has a struck capacity of 18 cu yd. The manufacturer claims that the corrugated construction reduces body deadweight by 30%.

A six-cylinder, four-cycle, direct-start diesel engine powers both units. The turbocharged DT-817 develops 375 hp. It powers the larger Payhauler. Top speed is 38 mph. The 250-hp naturally aspirated D-817 drives the model 65 Payhauler. Its top speed is 36.46 mph.

The model 95 Payhauler offers a choice of torque converter with power shift or a nine-speed, airshift transmission. The smaller model has a 10-speed, constantmesh transmission. International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

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#### Lightweight Screed Has Detachable Vibrator

The weight of this 4-ft-long screed with an aluminum beam is only 47 lb. With a steel beam it weighs 77 lb. Other lengths available are 5, 6, and 7 ft.

When not used as a screed, the vibrator can be unbolted and used for vibrating concrete.

The DUS screed consists of a Stow DU vibrator with a %-hp motor and a 1%-in. head mounted on an aluminum or steel channel with handles on each end. It operates at 9,000 to 12,000 vibrations per minute.—Stow Manufacturing Co., 443 State St., Binghamton, N.Y.

#### Loader Reverses Without Shifting

Multiple-disc hydraulically actuated reversing clutches on this loader permit instantaneous change of direction without shifting.

The Work Bull 1001 multi-purpose tractor loader has a rated capacity of 1 cu yd. Struck capacity is 34 cu yd. Its breakaway power is 5,200 lb. A self-leveling device for the bucket is optional.

—Massey-Ferguson, 1009 South West St., Wichita, Kan.

#### Portable Plant Screens While It Loads

No disassembly is necsesary for Barber-Greene's PS-70 portable screening plant. For highway travel, the screen merely folds under the conveyor. The screen can also be removed and the conveyor used separately.

The unit consists of a vibrating screen, portable belt conveyor, and a reciprocating hopper or trap feeder. The conveyor has a V-type truck with a hand hydraulic jack for raising it into operating position.

A gasoline engine powers the screening plant. V-belts drive the first and second countershafts. Chain drives are used for the conveyor headshaft and the screen.

A head-pulley clutch located at the head end of the conveyor controls the feeder and conveyor but allows the screen to operate continuously.—Barber - Greene Co., Aurora, Ill.



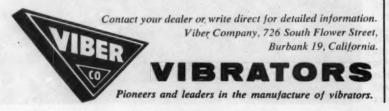
June 1959—CONSTRUCTION METHODS and Equipment—Page 179

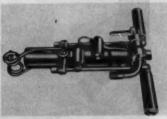
# 64 Concrete Vibrator Combinations from 12 Basic Components!



Quickly and Easily, in the Field, your men can assemble any one of 64 different concrete vibrator combinations from the 12 basic components shown above!

Because the Viber line is the most versatile line available, Viber flexible-shaft internal vibrators help you reduce your capital investment—reduce your day-to-day operating and maintenance costs—meet all your concrete vibrating needs.





#### Lightweight Rock Drill

The Davey-Holman SL-90 rock drill weighs only 42 lb. The overall length with retainer is 22% in. Standard chuck is % in. hex by 3¼ in. Two optional chucks are available.

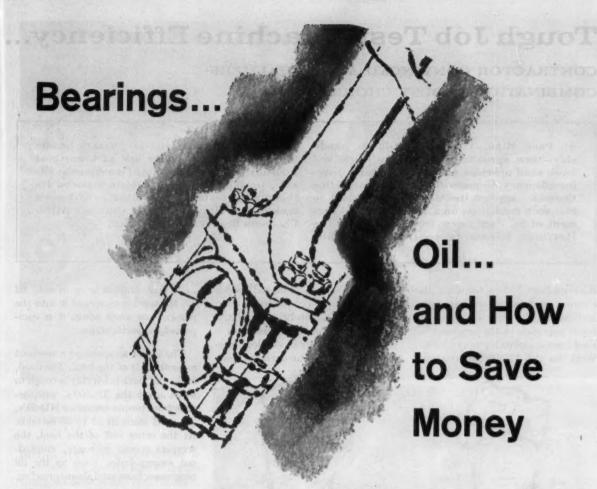
The drill converts without dismantling from blower type to blast type or to wet type with manual valve. Other design features include a honed cylinder bore; simple disc type, positive action valve; and lightweight front cover with one-piece coil spring retainer. — Davey Compressor Co., Kent, Ohio.



#### **Big Capacity Truck Crane**

The new Lorain Moto-Crane MC-218 has a highway speed of 43 mph and 18-ton capacity. Construction of the 180-in.-long carrier features front bumper and outrigger boxes integral with frame, side-by-side telescopic outrigger beams, hydraulic steering, and a drive train that automatically applies engine torque to the wheel having the best footing.

The MC-218 is fully convertible to shovel, crane, clamshell, dragline, and hoe. The turntable can be mounted on the carrier in two positions for either maximum crane capacities or for best digging ranges. This position change can be made easily on the job.—The Thew Shovel Co., Lorain, Ohio.



The longer your engines run before need of overhaul—the less your cost of operation. Sinclair Tenol® Motor Oils have earned the reputation not only for giving long bearing life, but also for resisting the formation of harmful carbon deposits. Tenol Oils slash down—time and maintenance costs. Next time management asks how you've cut costs, tell them you've switched to Sinclair Tenol—and show them the results.

Call your Sinciair Representative for further information or write for free literature to Sinciair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation. Sinclair Tenol Motor Oils

#### Tough Job Tests Machine Efficiency...

CONTRACTOR CONVINCED ALLIS-CHALMERS
COMBINATION IS BEST CHOICE

St. Paul, Minn.—Loading rock-laden, sandy clay—then spreading in swampy muck and loose sand provides a real test of earth-moving efficiency. Kimmes-Bartelma Construction Company applied its Allis-Chalmers fleet to just such conditions on a 1,900,000-yard segment of St. Paul's new freeway system. The Hastings, Minnesota, contractor's TS-360

motor scrapers with HD-21 pushers handle the demanding job faster and at lower cost than any other combination of machines available, partner Charles Bartelma reports. He thoroughly tested three other well-known makes—convinced himself that his Allis-Chalmers fleet is the best choice.

Kimmes-Bartelma is handling the clearing, grading and sub-base preparation on a 2.9-mile section of the north approach to the proposed St. Paul freeway (trunk highway 35-390). Work on the \$1,469,000 contract

started in October, 1958, and the job is expected to be completed by July, 1959. Approximately 10% of the 1,900,000 yards of excavation is swamp work. Dragline-loaded, tractor-drawn scrapers haul out the muck

... motor scrapers bring in sand fill ... tractor-dozers spread it into the mucked-out areas where it is compacted to specifications.

The motor scrapers get a workout on both ends of the haul. The dead, rock- and sand-laden clay is tough to load . . . yet the TS-360's, with assists from torque converter HD-21's, get good loads in 30 to 35 seconds. At the other end of the haul, the scrapers spread in soggy, mucked-out swamp holes. Even as the fill progresses, loose sand slows spreading.

A compensating factor, however, is the finely dressed haul road maintained by an Allis-Chalmers FORTY FIVE motor grader. The excellent condition of the haul road permits scrapers to highball the 2,300-foot th

job

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Sylvester Kimmes, partner Kimmes-Bartelma Construction Company Hastings, Minnesota



Charles Bartelma, partner Kimmes-Bartelma Construction Company Hastings, Minnesota



Allis-Chalmers TS-360 with HD-21 pusher gets good loads of dead, sandy clay in as little as 30 seconds.



Much of the credit for excellent cycle time goes to the Allis-Chalmers FORTY FIVE motor grader which keeps haul roads in top condition.

... move ahead with



Allis-Chalmers tractor-dozers push fill into swamp holes which had been mucked out by tractor-scrapers and draglines.

haul... cut average cycle time to 3 minutes, 33 seconds. Bartelma calls this good time in any conditions... excellent under those prevailing on this job. "The low, wide bowl makes loading easy and the forced ejection gets all material out in a hurry," he said. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.



Open-type design of these Allis-Chalmers pull scrapers permitted dragline loading of muck eliminated need for special added equipment.



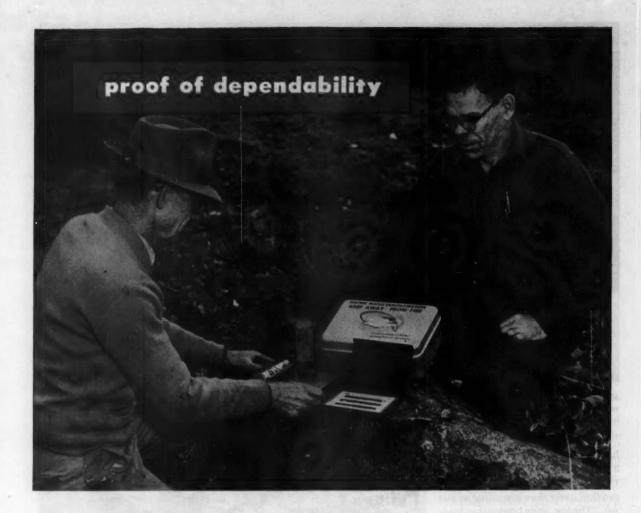
225 net engine hp Torque converter drive
56,260 lb approx. as shown



**TS-360** 20-yd capacity 280 horsepower 49,050 lb



h ALLIS-CHALMERS...power for a growing world



# See this Demonstration!



Your Atlas Representative Can Show You Actual Performance of Unique Electric Match Contained Only in Atlas E.B. Caps

All Atlas Electric Blasting Caps are fired with tiny electric matches so dependable that the armed services use thousands of them in missiles and rockets.



You can prove for yourself how sure-fire Atlas caps really are. Your Atlas representative has an interesting test firing kit to show you. Pick a match at random from his stock and fire it yourself... see how it can be depended on to fire in your blast hole.

Your Atlas man can show you why, too. Every part of every Atlas match is pre-tested, and the match is completed by multiple dips in high quality flash compounds.

Your Atlas representative will be glad to show you this demonstration, and to help you use Rockmaster and regular Atlas E.B. Caps for dependable initiation and timing to get effective, economical blasting.

Write for your copy of the new 60-page Handbook of Electric Blasting by D. M. McFarland and Guy F. Rolland.

#### Lightweight Aluminum Shores Collapse for Easy Handling

One man standing at the top of a trench can install or remove these aluminum shoring members. The SAF-T-JAX consists of two opposing aluminum shoring members separated and supported by hydraulic jacks. Hinges connect the hydraulic cylinders to the shoring pads. For storage and handling they fold together into 5½-in. high units. The shoring pads have a strength equal to that of first grade 2x8 timbers.

Two models of the SAF-T-JAX are available with shoring pad lengths of 2½ ft and 7 ft. Both units have 8 in. wide extruded aluminum alloy shoring members supplied by Kaiser Aluminum. The standard units will brace trenches 20 to 28 in. wide. With extension rods trenches up to 70 in. wide can be braced.—Sigma Engineering Corp., 990 North Tenth St., San Jose, Calif.





#### Hopto Backhoe Travels On Either Tires or Tracks

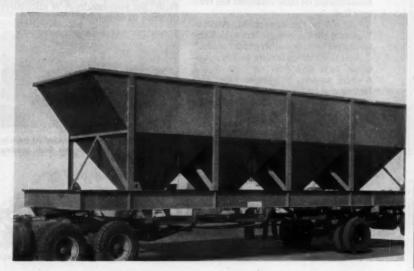
The %-yd model 200 Hopto backhoe is available with a choice of two undercarriages. The rubbertired version has a top speed of 25 mph. The turning radius of this model SPR undercarriage is 16 ft. The two hydraulic outriggers are individually controlled. The backhoe's swivel seat rotates to face the controls of either the carrier or the hoe.

The crawler-mounted model SPC undercarriage has a top speed of 2 mph. The tracks are 17 in. wide and 9 ft 6 in. long. Track bearing pressure is 4.5 psi. A 54-hp six-cylinder engine powers both tractor and backhoe. The unit has power brakes and a chain drive.—Badger Division, The Warner & Swasey Co., Winona, Minn.

#### Feeder Bin Holds 80 Tons of Aggregates

This four-compartment portable feeder bin has a storage capacity of 80 tons. It will feed sand and coarse aggregates for hot mix asphalt plants at rates of up to 250 tons per hour.

The two forward compartments generally are used for sand. Each of the two has an independent belt feeder that discharges onto the main conveyor belt. Coarse aggregates from the third and fourth compartments discharge onto the main conveyor belt through adjustable gates.—Standard Steel Corp., 5001 South Boyle Ave., Los Angeles 58, Calif.



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Operator demonstrates hydraulically controlled side-shifting action of blade Western power grader.

#### All-purpose Austin-Western graders speed highway project...shorten job by 2 months

"We completed a 3-mile dual highway project 2 months ahead of schedule with the help of our three Austin-Western graders," says Charles Solomon of S. D. Solomon & Sons, Pontiac, Mich.

#### Versatile A-W's unsurpassed

He tells us, "The A-W's are versatile machines. They can do many more kinds of work than any other single grader sold. They're unsurpassed for jobs in sand or tight corners. They do rough or finish grading, sloping and ditching equally well. We have three Austin-Westerns—a 4-wheeler and two tandems. Maintenance on these machines has been very low.

"As far as I'm concerned, Austin-Westerns are the best graders sold. They far outperform any other grader made.

Austin-Westerns feature exclusive allwheel drive and steer on both 4 and 6-wheel models. You move more dirt farther and faster with an A-W because of power up front. No dead weight front end to push around.

All-wheel steering permits you to steer the rear to compensate for powerful sidethrust of a fully loaded blade. You can use the full 13-ft. moldboard and still grade ahead in a straight line. Front and rear steer provide amazing maneuverability for short radius work. An A-W can work in close quarters where other graders cannot.

#### **Built to outperform**

Austin-Westerns are quality built to outperform! Maintenance requirements are low. Distributor service is excellent. Choice of gas or diesel power. Torque converter optional. Hydraulic controls reduce operator fatigue . . . increase his efficiency.

Learn how Austin-Western graders can speed your jobs to give you added profit! See your nearby A-W distributor or write us today.



Rear steering permits operator to offset machine for extra blade reach in this finish grading



#### Fiber Board Void Forms Speed Slab Construction

Void forms made of asphalt and wax-impregnated fiber board laminated with weatherproof glue take the place of sand, gravel and other fill materials in beam and slab construction on grade. The manufacturer claims that the fiber board can withstand loads of 700 lb per sq ft, after being immersed in water for 45 minutes. The void forms can support loads of 800 to 1,000 lb per sq ft depending on the dimensions of the forms.

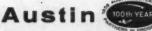
During pouring of beams and slabs the forms support the weight of the concrete. After curing, the corrugated forms deteriorate and leave the necessary voids under the slab.

These forms, known as Jay-Voids, are available in 4 and 6-in. heights. Width ranges from 6 to 12 in. The length of the forms is 64 in. Most sizes weigh less than 1 lb per linear ft of form. Other forms available are rib slab forms, waffle slab forms, and hollow slab forms. - Lawrence Paper Co., Lawrence, Kan.

#### **Concrete Vibrators**

A flexible-shaft model and a motor-in-head model are two new Champion concrete vibrators. A 1½-hp electric motor powers the flexible-shaft vibrator. It has a twin variable eccentric that allows variation of amplitude and frequency. Other features include an adjustable canvas carrying strap for the motor, removable steel or rubber tips for the head, and spear tips for getting into tight spots.

The head of the motor-in-head vibrator weighs 14 lb. The motor section is removable. This unit operates on 60-cycle, 110-volt ac or dc current. It has built-in protection against circuit overload and excessive heat. - Champion Manufacturing Co., 3700 Forest Park Ave., St. Louis 8, Mo.



Power graders . Motor sweepers . Road rollers . Hydraulic cranes



#### Sidewalk Canopy Frames

Canopies for pedestrian protection are constructed of frames 7 ft 6 in. high and 6 ft wide. These Trouble Saver scaffolding frames are composed of tubular steel members with reinforcing sections. Other components include base plates and adjustable legs. Successive frames are joined together with diagonal braces.

Additional sectional scaffolding may be erected on planking laid across the tops of the frames.—
The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N.Y.



#### Razes Brick Walls

This demolition grab is approximately the same size as a ¾-yd clamshell bucket. In razing brick wall construction it takes large chunks of wall and loads them directly into trucks. The grab has adjustable jaw plates to accommodate walls of varying thicknesses. It is especially useful for reducing breakage where bricks are to be reclaimed. — Williams Bucket Div., The Wellman Engineering Co., 7000 Central Ave., Cleveland 4, Ohio.



Austin-Western Roller-Compactor combines static and vibratory force to work fines into stone base aggregates.

# Austin-Western Roller-Compactors let you lay fewer courses—cut costs!

Austin-Western Roller Compactors do a deeper, faster consolidating job. They combine the advantages of both vibratory and static compaction, assuring maximum density of all types of material and profitable operation.

#### Vibrates up, rolls down

For vibratory compaction, three 450-lb. shoes are attached to a basic 3-wheel roller. Each shoe, hydraulically operated, vibrates approximately 2200 times per minute. This motion extends to the bottom of the lift and then reacts upward, thereby keying low-level material for maximum consolidation in the fewest number of passes. At the same time, the roller unit applies static pressure so as to effectively seal the surface.

There is more profit to be made with an Austin-Western Roller-Compactor. It operates at speeds up to 1 mph. Fewer passes are required because of its efficient double action. Fewer courses are required. It compacts lifts of stabilized material up to 12 in. in successive passes . . . no more need to

remove previous courses if final tests reveal insufficient density.

#### Designed for rugged service

Maintenance requirements are low. Vibratory units are sealed in oil, completely protected from dirt... designed for dependability under rugged service conditions. Available now for Austin-Western and most all other makes of 3-wheel rollers. Get full information today on the cost cutting Austin-Western Roller-Compactor. See your nearby A-W distributor or write to us.



Vibratory widener attachment — for use with any 3-wheel roller equipped with A-W Roller-Compactor unit . . . may be mounted left or right.



BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes



#### Jaeger pumps know how to handle water

Two independent, simultaneous priming actions . . . fast and doubly sure. • Oversize shells and impellers, engines of largest horsepower applicable. • The only positively lubricated shaft seal with ready inspection port. • Prime without racing, pump at slower speeds, pump more thousands of hours. Performance guaranteed. Sizes 1½" to 10". See your Jaeger dealer or send for Catalog



THE JAEGER MACHINE COMPANY . 800 Dublin Ave., Columbus 16, Ohio

COMPRESSORS . . MIXERS . TRUCK MIXERS . SPREADERS . FINISHERS



Your problems are our problems when you are looking for big economy in transporting heavy equipment, fabrications, construction supplies. On-site delivery by water means lowest cost to you!

• Over 60 years experience... a whole modern Charter Fleet of barges, scows and floating equipment for every requirement... at your service from Florida to Maine, on the Great Lakes and St. Lawrence Seaway. Call us at any time, no obligation.

# JAMES HUGHES, INC.

17 BATTERY PLACE, NEW YORK 4, N. Y. TEL. WHITEHALL 4-1048



#### Truck Crane Handles Heavy Loads

This truck crane can lift and walk with a 63,000-lb load. It also handles 5,000 lb over the rear on a 150-ft boom at a radius of 100 ft. Boom lengths vary from the standard 30-ft length up to a 150-ft boom and jib. The unit handles crane, clamshell, dragline, or pile driving jobs. The rated capacity is 40 tons.

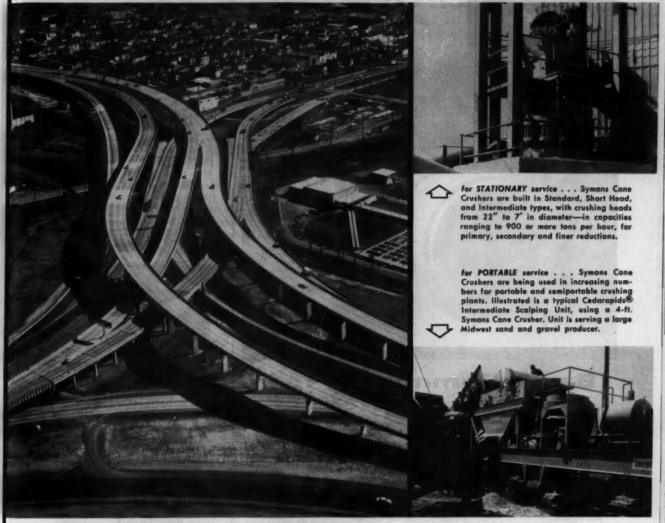
The 8x4 carrier features removable outrigger beams and supports. Air brakes on all wheels and power steering are standard. The variable speed transmission has 12 speeds forward and 3 in reverse. Other standard equipment on the model 610-T8440 includes foot throttle, precision load lowering device, positive house lock, swing brake, independent boom hoist, telescopic boom backstops, collapsible high gantry, automatic boom hoist clutch safety stop, and removable one-piece counterweight. The crane strips down to 17,270 lb per rear axle and 13,120 lb per front axle.— Bay City Shovels, Inc., Bay City, Mich.



#### Three New Engines by International Harvester

Gasoline, LP gas, or natural gas fuels International's three new power units. Two are six-cylinder engines and one is a four-cylinder engine. The six cylinder UC-263 develops 95 hp and the UC-221 develops 75 hp. The four-cylinder

#### BIG TONNAGES of quality aggregate produced at low cost with SYMONS Cone Crushers



Typical of today's modern highway construction is this view of the modern Freeway in Oakland, California, showing three levels of highway structure over two levels of railroad.
(Phote courses California Division of Highways)



C-159

The big tonnages of specification aggregate, bituminous mixes, crushed sand and cement required to meet the ever-increasing needs of the construction industry are produced by Symons Cone Crushers at low cost. Good reasons why these efficient crushers are the leading choice of producers and contractors building highways, dams and hydro projects, bridges, as well as commercial building construction.

It will pay you to specify and use Symons Cone Crushers for both stationary and portable service. Write for descriptive literature.

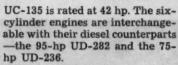
NORDBERG MFG. CO., Milwaukee 1, Wisconsin





SYMONS . . . a registered Nordberg trademark known throughout the world

ATLANTA . CLEVELAND . DALLAS . DULUTH . HOUSTON . KANSAS CITY . MINNEAPOLIS . NEW ORLEANS . NEW YORK . ST. LOUIS SAN FRANCISCO . TAMPA . WASHINGTON . TORONTO . VANCOUVER . JOHANNESBURG . LONDON . MEXICO, D. F.



The six-cylinder models have 7.2 to 1 compression ratios. Other features include machined combustion chambers, exhaust valve rotators, stepped-dome pistons, and I-block crankcases. A 12-volt electrical system is standard.

The four-cylinder engine has a 7.3 to 1 compression ratio, aluminum alloy pistons, and a six-volt electrical system.

Other standard features of all three engines are valve-in-head design, pressure lubrication, replaceable sleeves, and updraft carburetion.—International Harvester Co., Chicago, Ill.



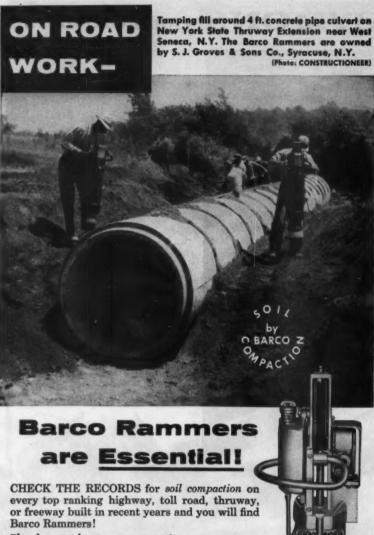
#### **Combination Drill-Anchor**

The "Saber-Tooth" combination drill-anchor drills its own hole, then becomes a masonry anchor. After the hole is drilled, a steel expander plug is placed in the drill end. The anchor is driven home, and it expands over the plug at the bottom of the hole. It has a holding power of up to 17,-860 lb.—The Rawlplug Co., Inc., New Rochelle, N.Y.

#### Expanded Series of Belt Conveyors

The Redi-Fab belt conveyor series has been expanded to give increased lengths, a new drive unit, and a wider range of accessories.

Lengths in the new series range from 18 to 240 ft. Belt widths are 18, 24, and 30 in. Capacities range up to 480 tons per hour. The conveyors are complete with head ends, tail ends, truss sections, troughing carriers and return rolls, and belting. The torquearm drive is standard equipment. Accessories include backstops, swivel spouts, belt scrapers, fixed and adjustable A-frames, walkway supports, tail end and inter-



The key to better construction—No modern trend has had a more phenomenal growth than the specification of HIGH DEGREE SOIL COMPACTION for all kinds of projects.

Easily meet rigid specifications—In test after test, Barco Rammers have delivered 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful in restricted areas. ONLY Barco can produce specified high degree compaction on lifts up to 20 inches.

Get jobs finished on time—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. ASK FOR A DEMONSTRATION.



BARCO MANUFACTURING CO. 5126 Hough Street • Barrington, Illinois

BARCO RAMMER for High Degree Soil Compaction

ARCO VIBRA-TAMP for Granular Fill and Bituminous Surfacing

# WHAT MAKES YOU MOR

Total Output...or **Bucket Capacity?** 

ANSWER: It's how fast you finish the job! The M-F Work Bull 1001 with one-cubic yard payload is fast, maneuverable, and efficient. In competitive field demonstrations it has actually finished ahead of larger machines that cost thousands more. Let a Massey-Ferguson Industrial Dealer prove it .

Performance...or **Brute Strength?** 

ANSWER: It's how well you do the job for the money! The Work Bull 1001 makes maximum use of its power for lower operating costs. A unique direct-line thrust from low pivot points enables it to dig and transfer the weight of the payload to the drive wheels, adding traction and power.

Versatility...or Specialty?

ANSWER: Versatile equipment that makes a good profit on both large and small jobs. The Work Bull 1001 fills the gap between small utility loaders and expensive, specialized equipment. It's designed to be a master over a multitude of jobs and has many attachments.

#### MASSEY-FERGUSON'S WORK BULL 1001 MEETS THE CHALLENGE!



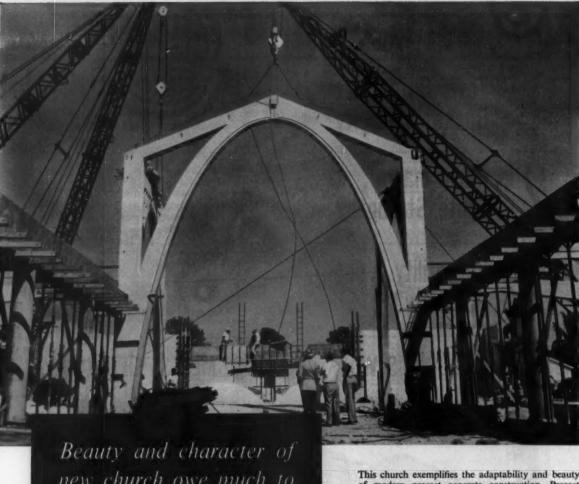
**FORWARD OR REVERSE** 

Instant Reversing with Torque Converter on the Work Bull 1001 gives it unsurpassed maneuverability and speed on the job... No clutching... shifting...or levers to pull to change direction of travell

Seeing is believing. Ask for an "on-the-job" demonstration today!



ASSEY-FERGUSON INDUSTRIAL DIVISION 1009 SOUTH WEST STREET . WICHITA 13N, KANSAS



new church owe much to PRECAST CONCRETE

This church exemplifies the adaptability and beauty of modern precast concrete construction. Precast units serve both structurally and decoratively, and include 28 arches of varying sizes, 2 spire grills, 4 ornamental grills, and 42 precast window frames and sills. The largest arch is 32' high.



Architects-Engineers: T. Norman Mansell, Philadelphia, Pa.
Scott B. Arnold Assoc., Miami, Fla.
Contractor: Thompson-Polizzi Construction Co., Coral Gables, Fla.
Precast Units Supplied by: Lewis Manufacturing Co., Miami, Fla.

Soaring arches, ornamental grills, window frames and sills—all precast concrete—lend enduring beauty and character to the new St. Peters Lutheran Church, Miami, Fla.

In precasting this wide variety of concrete units, Lewis Manufacturing Company used Lehigh Early Strength Cement for maximum production efficiency and economy.

"Our entire operation," writes Mr. Lewis, "has always been geared to the use of Lehigh Early Strength Cement and live steam curing. This fast production method enables us to give our customers better service, at lower cost."

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction.

Lehigh Portland Cement Company ALLENTOWN, PA.

LEHIGH EARLY STRENGTH CEMENT . LEHIGH PORTLAND CEMENT . LEHIGH AIR-ENTRAINING CEMENT . LEHIGH MORTAR CEMENT

Page 192-CONSTRUCTION METHODS and Equipment-June 1959

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mediate anchors, belt housing, belt retainers, and grease pipe extensions. Self-shedding, heavygage, galvanized steel decking protects the belt from falling material on the return run.

The Warren truss frame is assembled in the field by bolting the cross members to the side panels. It can be knocked down quickly and reassembled in another location. The conveyors are easily lengthened, shortened, or altered to meet conditions.—Barber-Greene, Aurora, III.



#### Portable Compressors Are More Compact

The Gyro-Flo 250-cfm portable rotary compressor replaces the old Gyro-Flo 210. The new machine has greater capacity, but it is smaller and more compact than its predecessor.

Power source is a GM 4-53 diesel or a Continental M-363 gasoline engine. Engine speed is 1,-800 rpm. The unit is equipped with two or four-wheel mounting, or without running gear for truck or skid mounting. The weight with four-wheel running gear and diesel engine is 4,193 lb.

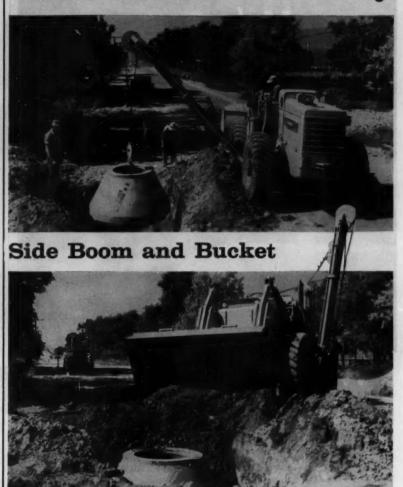
Other design features include a 12-volt battery system, easy access for inspection of all compressor rotor vanes, side covers that fold back out of the way, and full-length tool boxes. Fuel and air tanks are under housing and lockable cover.

Also new is a 125-cfm Gyro-Flo compressor. It is smaller than the original Gyro-Flo 125. Either gasoline or diesel Continental Red Seal engines are available. Engine speed is 1,800 rpm. The compressor has a two-wheel mounting or no running gear for truck or skid mounting. With running gear and diesel engine it weighs 2,503 lb. Other features are the same as those on the Gyro-Flo 250.—Ingersoll-Rand, New York, N.Y.

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#### PAYLOADER° versatility



Even seasoned contractors are amazed at the number of jobs a "PAYLOADER" tractor-shovel can handle when equipped with the exclusive Superior-Hough side boom attachment. Because the boom is side-mounted, it does not interfere in any way with the use of the bucket—the "PAYLOADER" can work as a shovel and a crane at the same time without losing time making equipment changes.

As a side boom it can set precast manholes, spot heavy equipment, unload and string pipe, pull sheeting, walk and work over pavement and curbs without damage. The hydraulically operated boom telescopes from 10 to 16-ft. in length, lifts 10,000-lbs. at 4-ft. overhang, more than a ton at 14-ft. As a shovel the "PAYLOADER" has a bucket carry capacity of 9,000-lbs, that can be used to backfill trenches, dig and load excess dirt, clear and grade rights of way, charge hoppers and do many other material handling jobs.

4-wheel-drive "PAYLOADER" tractorshovels handle easily (power-shift transmission, power-steering), travel fast (up to 24 mph) to work profitably on widely scattered job locations in a single day. A nearby Hough Distributor has complete details — contact him or write!

## HOUGH'



THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, III.

Send Side Boom data to:

City

State

6-8-2



White

L-20 ASPHALT PLANT

\$700 A TON Make your own hot mix asphalt with this new WHITE plant and save about \$2.00 a ton. At its capacity of 240 tons a day, that's savings of \$480.00 a day. Thirty-one of those days pay for the L-20!

Produces any type mix you can get from a \$100,000 plant: AC, RC, MC, SC and emulsified for top course, base course, one course, or patch. Two men operate. Capacity is rated at a hot 315 degrees.

Available either portable or stationary, the L-20 will supply black-top for suburban streets, driveways, parking lots, school yards, or state highway maintenance. See nearest White distributor or mail coupon.



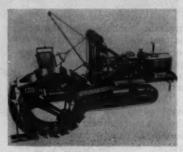




Manufacturers of quality construction equipment since 1925.

#### COUPON FOR FREE

White Manufacturing Company, Elkhart 6, Indiana Also send literature on: TROWELERS Please send literature on L-20 Asphalt Plant. ☐ VIBRATORS name TAR KETTLES Dealers: Check here address for franchise availability in your area.



#### Pipeline Ditcher

The Gar Wood-Buckeye 318 pipeline ditcher digs up to a depth of 7 ft and a width of 44 in. The crawler-mounted unit can discharge spoil from either side of the wheel.

The ditcher has a torque converter with a throttle that lets the operator vary the output within any gear range without loss of horsepower. The wheel hoist and conveyor drive are hydraulic. All hydraulic functions are independent of wheel, conveyor, or forward speeds. Power transmission on main drives is by universal joint drive shafts .- Gar Wood Industries, Inc., Wayne, Mich.



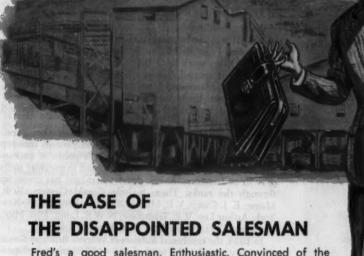
#### Good for Corner Work

Masonry, granite, marble, tile, reinforced concrete, and refractories are no problem to this new drilling machine. It weighs 56 lb and requires only one operator for precision core drilling of holes ½ in. to 6 in. O.D. It has a triangular, two-position base that allows close corner drilling. A slot in the base affords greater flexibility for wall mounting. The core bits are made of diamonds set in a hand matrix.

A heavy duty Thor motor with integral water swivel and overload switch powers the unit. The model 5 drilling machine operates on 110-volt current.-Dura Diamond Tool Co., South El Monte,

# THE BIG

.. SURPASSES EXPECTATIONS!



Fred's a good salesman. Enthusiastic. Convinced of the proven superiority of the Eimco 105 Overhead Loader. But there are times when even a top salesman can't fight it. That was the case with Fred, when he wrote the following report to the home office:

"I have for many months been looking forward to getting another order for an Eimco 105 here\*, but THIS ONE (Eimco 105 Overhead Loader) IS SO FAR AHEAD OF THEIR EXPECTATIONS AND THEIR PRODUCTION WITH THIS MACHINE IS SO NICELY HANDLED, THAT I DOUBT IF THERE WILL BE ANOTHER ORDER FORTHCOMING FOR QUITE A LONG WHILE."

"THEIR COSTS IN THIS MINING OPERATION ARE SO FAR BELOW THEIR CONSULTING ENGINEER'S ESTIMATES AND THEIR PRODUCTION HAS BEEN SO MUCH HIGHER THAN THEY EXPECTED, THAT THEY HAVE CURTAILED PLANS FOR EXPANDING THE DEVELOPMENT OF THIS PROPERTY."

What's a salesman to do? Fred had the answer. Make sure that other mining operators also learn about the savings potential, high production of the Eimco 105 Overhead Loader Crawler-Tractor. Fred, or one of his associates . . . the salesengineers of The Eimco Corporation . . . will be glad to demonstrate the multiple advantages of the modern tractor . . . the rugged, reliable, maneuverable Eimco 105.

\*--Original letter and name of mining company on file.

Just contact the sales office nearest you or The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A. Tell 'em Fred suggested it!



THE EIMCO CORPORATION
SALT LAKE CITY, UTAH

EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y. BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

# Warren Brothers Roads Company carves out America's roads, airfields, etc.,

... with over 1,000 men, \$6 million of materials and 1,000 units

■ Among the 3,559° contracting firms that did \$1 million or more of construction in 1958 is Warren Brothers Company, headquarters in Cambridge, Massachusetts. It is one of the nation's 117 oldest contracting firms. The firm's heritage goes back to 1900 when it was founded by the five Warren brothers in Boston. The success it attained in asphalt paving led to continuous growth and expansion, as it extended its operations across the nation. Today, Warren Brothers Co. consists of fifteen operating subsidiary and affiliated companies. They are:

\*Reported by Construction Daily

Atlantic Bitulithic Company, Richmond, Va.
Columbia Bitulithic Ltd., Vancouver, B. C.
Granite Bituminous Paving Co., St. Louis, Mo.
Gulf Bitulithic Co., Houston, Texas
Knoxville Construction Co., Knoxville, Tenn.
MacDougald-Warren, Inc., Atlanta, Ga.
Middle West Roads Co., Louisville, Kentucky
Standard Bitulithic Co., Newark, N. J.
Texas Bitulithic Co., Dallas, Texas
Tuskegee Asphalt Corp., Tuskegee, Ala.
Warren Bituminous Paving Co., Ltd., Toronto, Ont.
Warren Brothers Roads Co., Cambridge, Mass.
Warren Maritimes, Limited, New Glasgow, N. S.
Warren Northwest, Inc., Portland, Ore.
Warren Southwest, Inc., Los Angeles, Cal.

Warren Brothers Company has gained national recognition as builders of streets, highways, expressways, airfields, parking areas; constructors of Portland cement and bituminous concrete paving for public industrial and private use; suppliers of asphalt paving mixtures and ready-mixed concrete. In 1958, the combined companies did \$76.5 million of construction, and a total of \$69.4 million of contracts was obtained during the year. \$2.5 million was spent for the purchase of trucks, new machinery, modernizing of plants and related equipment. Lets look into the operations of one of the subsidiary companies; Warren Brothers Roads Company, Cambridge, Mass.



One of Warren Brothers Roads Company's 21 asphalt plants in eperation. Twelve of these plants are stationary and nine portable. In 1958, the company produced 1,155,193 tons of blacktop.

#### Roads Company did \$16.4 million of construction in 1958

Warren Brothers Roads Co. had its beginning in 1900 in Boston. It was the original of the present fifteen operating companies. From its beginning the company's prime type of construction work has been asphalt paving. As the company grew it opened district offices in five other states extending from Maine and New York to Alabama, Mississippi, and Tennessee. Each district office operates independently with a district manager in charge. All work is performed out of these districts.

Heading up the company is J. Warren Shoemaker, president, who is celebrating his twenty-fifth year in this top post. Warren Brothers Roads Company's policy of promotion from within the ranks has contributed in measure to its growth and success. Every district manager has come up through the ranks. These include Gerald Costain, V. P., Maine; E. J. Casey, V. P., Mass.; Gilbert A. Bruno, V. P., New York; Arthur Lee, V. P., Tennessee; N.W.E. Long, Dist. Mgr., Alabama; C. H. Richardson, Dist. Mgr., Mississippi.

In 1958, the combined districts of Warren Brothers Roads Company completed a total of \$16,443,000 of asphalt paving, aggregate production, street and highway construction, airport paving and concrete revetment work.

#### \$118,000,000 construction completed in 10 yrs.

Indicative of the magnitude of work which Warren Brothers Roads Company is capable of doing is the significant growth in construction completed each year... from \$6.6 million in 1949 to \$16.4 million in 1958. The total completed in this 10-year period was \$118,173,000.

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To complete this much work, Warren Brothers Roads Company combines top manpower and machinery into an

efficient, productive working force.

#### Employs over 1,000 men and 1,000 units of equipment

Warren Brothers Roads Co. has a permanent staff of 184 and a working force of 900 men at the peak of operations throughout the six districts. These men put some 1,000



\$1,200,000 paving contract for resurfacing 15 miles of U. S. Highway 70, South of Huntington, Tennessee. Some of Warren Brothers Roads Company's 990 units of equipment shown in action.

## \$16.4 million of in a year...

#### of construction machinery

units of construction equipment of every type to work. Here is a breakdown of this major equipment, valued at \$5.8 million.

53 automobiles-(all makes)

87 trucks, pickup-(Ford, Dodge, International)

16 trucks, tractor-(Mack, Diamond T, International, GMC)

59 trucks, dump-(Ford, GMC, Chevrolet)

56 trucks, other-(distributor, water, platform, grease, batch)

42 pavers-(Blaw-Knox, Barber-Greene, Trac-paver)

19 compressors—(Ingersoli-Rand, Gardner-Denver)

29 shovels, cranes-(Northwest, Lorain)

23 diesel power units-(Caterpillar, GM, Murphy)
34 motor graders-(Caterpillar, Austin-Western, Allis-Chalmers)

21 asphalt plants-(Warren, its own) 97 rollers—(Buffalo-Springfield, Galion)

13 rollers-trench, pneumatic and vibrating-

(Ferguson, Bros, Buffalo-Springfield)

30 spreaders—(Warren, Jersey, Burch) 32 crawler tractors—(Caterpillar)

23 front end loaders-(Hough, Michigan, Trojan, Caterpillar)

37 trailer units-(Rogers, Martin)

22 Welding Machines-(Lincoln, Hobart)

4 concrete paving mixers—(Koehring, Worthington)

22 base stations (radio)

110 two-way radios-(GE, Motorola)

6 crushing plants—(Pioneer, Cedarapids)

1 airplane-(Cessna 172)

1 concrete batching and mixing plant-(Blaw-Knox, Koehring)

284 miscellaneous units

#### \$1.4 million of new equipment bought in 2 yrs.

Contractors who are increasing the construction output like Warren Brothers Roads Company must expand their equipment inventory with new equipment. This contracting firm has invested over \$1.4 million in new machinery in 1957 and '58. This includes machinery of every description. Coupled with its investment in machinery in 1958, Warren Brothers Roads Company invested some \$6 million for construction materials including: 285,000 gals, of fuel, 178,000 bbls. of cement, 24,000 gals. of oil and grease, 69,500 tons of asphalt.

To keep its equipment in top running order, Warren Brothers Roads Co. invests \$845,000 on the average per year for maintenance. Thirteen buildings located throughout its districts are used for this important operation.

#### District offices establish budgets many influence purchases

Because of the size and scope of Warren Brothers Company, with fifteen affiliated and subsidiary companies, each company operates on an independent budget. And within a company such as Warren Brothers Roads Co., each district office operates on a separate budget, and submits its own to the home office in Cambridge. Each district manager sends in his requisition for equipment purchases along with his budget. Here's what J. Warren Shoemaker, president, says of this operation:

"I can't sit in my office and make purchases for my districts. We have meetings in the district offices regarding equipment needed and to be purchased. Mechanics, operators, managers, superintendents etc. all participate



. WARREN SHOEMAKER, President Warren Brothers Roads Company

#### A subscriber to CONSTRUCTION METHODS since 1934 says:

"CONSTRUCTION METHODS magazine gives me many good ideas on equipment and techniques which I often cut out and forward to our district offices. I often cut out editorial items and advertisements and file them under interesting technior equipment, and refer to them when looking for a specific method or type of equipment to do a certain job. I find the advertisements in CONSTRUCTION METHODS as useful as the

There are a total of 21 key men in Warren Brothers Roads Company who subscribe to CONSTRUCTION METHODS magazine.

in the meetings and top management is influenced to a great extent by the recommendations of these key peo-ple. Meetings help us to decide on what's needed. The budget is submitted to the home office following these meetings for my approval." This method of operation has proved most successful."

#### **CONSTRUCTION METHODS has penetration** in important contracting firms!

Like other important contracting firms throughout the United States, Warren Brothers Roads Company, with its 1,000 employees has key personnel in each district who look to Construction Methods and Equipment magazine for information of practical value in their work. In Warren Brothers Roads Company, a total of 21 key men subscribe to Construction Methods and Equipment . . . men with responsibility and buying influence.

Reach the key men in important contracting firms throughout the United States, such as Warren Brothers Company, with consistent advertising in Construction METHODS . . . the contractor magazine.

Construction



A McGRAW-HILL PUBLICATION 330 WEST 42nd STREET, NEW YORK 36, N. Y. Mr. Albert Isbell, Shop Superintendent, says:

"We solved our bearing problems 10 years ago ...with



The Isbell Construction Company owns and maintains over 1500 Diesel units operating in temperatures ranging from 40° below zero to 130° above—from 1000 to 9000 ft. elevation—all in heavy construction work—and giving longer service with trouble-free CLEVITE 77 bearings.

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Covering five western states, Isbell specializes in mining construction and general heavy construction. The job shown is a U.S. Highway 60 widening and aligning job, south of Salt River Canyon. They have been getting as much as 8,000 hours on Diesel engines before overhauls. Albert Isbell says: "We had trouble with bearing performance ten years ago. We had to have a bearing that would stay on the job—we found it in Clevite 77. Now, we use nothing else."

Fleet operators and engine rebuilders everywhere have learned that Clevite 77 bearings are the highest duty bearing available—anywhere. Patented tri-metal construction makes possible more corrosion-resistance, greater fatigue strength, superior running surface.

On your next engine overhaul—specify the best—specify Monmouth Clevite 77 bearings—available at all N.A.P.A. jobbers.

Monmouth

ENGINE BEARINGS

CLEVITE SERVICE: Cleveland Graphite Bronze . Division of Clevite Corporation . Cleveland 3, Ohio

MORMOUTH STATE ATTHE WORLD MORMOUTH STATE ATTHE WORLD MORMOUTH, Clevile and Micro are registered trade marks of Clevila Carnoration



#### New Power Plant For B Tournapull

The model B Tournapull now has a more powerful engine. The 360-hp GM-110T engine is a turbocharged six-cylinder, two-cycle diesel. It is available with an Allison torque converter transmission or with a step gear transmission. A 335-hp engine is optional. The scraper for this model remains unchanged.—LeTourneau-Westinghouse Co., 2301 NE Adams St., Peoria, Ill.



#### Improved Grate Roller Crushes, Cuts, Compacts

The Twin Crusher-Pak is an improved grate-type roller. It is designed for use with a tractor pulling a ripper. The roller follows the ripper pulverizing the dislodged lumps.

The unit consists of two drums with an overall width of 85 in. Ballasted with wet sand the roller weighs 25,000 lb. It has complete peripheral cutting edges and alternate breaker bars. Standard equipment includes internal cleaners, removable ballast tanks, rear towing eye, folding leg stands, adjustable draw-bar, and a universal swivel towing eye.—Eskridge Equipment Co., 1214 South Norwood, Tulsa 12, Okla.

#### **Dodge Diesel Trucks**

Dodge now offers a line of three new diesel trucks powered by Cummins engines. The NH-220 engine powers the 5-ton NCT 1000 truck. Other Cummins engines available are the NH-180, and the NH-195. The C-175 is a new 1,575-lb. turbo-diesel.

The gross vehicle weight of these trucks ranges from 27,000 lb



# Save up to \$1700 on Schramm 125 Compressors

Why pay more than necessary for a 125 cfm air compressor? Schramm gives you the lowest initial cost of any compressor manufacturer—plus additional cost savings in operation and repair. However, this lower cost is not from price slashing or quality cutting shortcuts, but is the result of lower manufacturing costs inherent in the production of piston-type compressors. It's a fact—you get superior quality at lower cost from the simplified design which can be manufactured more economically.

#### You also get increased savings with . .

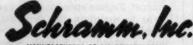
Lower fuel consumption Schramm Model 125 uses from 15% to 50% less fuel than competitive air compressors. Yet it delivers more power—a full 125 cfm of air, not just a fraction of it.

Less Maintenance Operating features of pistontype design provide more fool-proof operation, result in less downtime. Any mechanic can easily service without special training.

Fewer and Less Costly Replacement Parts 90% of the wearing parts between engine and compressor are interchangeable, fewer parts to replace. Replacement parts also cost less—as much as one-seventh of competitive parts.

Don't spend one cent extra for any size compressor until you can investigate all the facts. See your local Schramm Dealer, or write today for your copy of Bulletin SPB-58.

See the Yellow Pages for local Sales, Service and Rental of Schramm Air Compressors.



MANUFACTURERS OF AIR COMPRESSORS
604 North Garfield Ave. • West Chester, Pa.

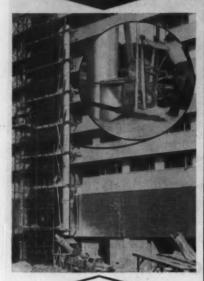


Schramm Portable 125 powers two pneumatic tools with full 125 cfm of air . . . produces full rated power—increases workers' efficiency.



Automatic air control is a feature of Schramm Compressors. The patented Schramm Pneumastat controls speed of each unit without operator manipulation. Engine operates from idle to full speed according to air demand.

# Easier, Better Handling of Construction Refuse Disposal!



#### Reuseable, Adjustable Metal Chute is Quickly Assembled and Disassembled

Field use of Wilkinson Scopeable Metal Chutes has proved their advantages over conventional wood types.

Consisting of large, round telescoping metal tubes, these chutes have large intake openings adjustable to any floor height. As the building progresses, the chute is extended and intakes added. At job completion the chute is easily disassembled for storage or removal to another job.

#### Advantages . .

Savings in chute construction and dismantling time.

Savings in the construction refuse disposal operation.

Better, more dust free construction refuse disposal.

A decided tax advantage as Wilkinson Reuseable Chutes can be depreciated as a capital investment. Write for complete details.

WILKINSON CHUTES, INC.

619 E. Tallmadge Ave. Akron 10, Ohio



#### EQUIPMENT NEWS ... continued

to 53,000 lb. The gross combination weight range is 50,000 lb to 76,800 lb.—Dodge Division Chrysler Corp., Detroit, Mich.



#### **Crawler Crane**

The latest addition to Unit's equipment line is the model 1220 %-yd excavator. When equipped for crane operation, it has a capacity of 16 tons.

Standard design features include automatic traction brakes, twin hook rollers, involute splined shafts, and one-piece cast gear

Power is available from a GM diesel engine with or without torque converter or a Chrysler eight-cylinder gasoline engine with torque converter. — Unit Crane & Shovel Corp., 6411 W. Burnham St., Milwaukee 19, Wis.



#### Magnetic Road Sweeper

It looks like a four-wheeled tractor, but the Magna-Sweep is a magnetic road sweeper. A 5-ft long electro-magnet, mounted under the tractor, is capable of picking up a 500-lb steel plate.

A 5-kw, 120-v dc generator driven by a power takeoff from the tractor engine energizes the magnet. Engine speed is governed so as to maintain the generator speed at 1,750 rpm, giving the unit a speed of 5 mph when sweeping. — Consolidated Diesel Electric Corp., Stamford, Conn.





Built to withstand the hard knecks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, host lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.

INTERNALLY ATTACHED BANDLE— In sizes 36" to 1½" volves stem and hundle are combined in a strong onepiece forged steel unit which is anchored to the bronze plug within the volve body. This patented feature eliminates stem and handle breakage. Sizes ½", ½", ½" and 2" have axternally riveted hundles.



Male I. P. T. Both Ends

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL DIFFICES & FACTORY—PHILADEEPHIA 22 PA



WAREHOUSE

MIEL CONSTRUCTION CO. PHOTO



SUPERIOR Stress Equalizers, Pick-Up Inserts, and Lifting Angles were used on this panel.



ADJUSTABLE BRACES used for quick and easy alignment of panels

# "PICK-UP" INSERTS ANCHORS FOR BRACES STRESS EQUALIZER ADJUSTABLE BRACE PLANNING AND LAYOUT SERVICE

### SUPERIOR

Has the Accessories
AND the System
for TILT-UPS...

# FROM ORIGINAL LAYOUTS TO FINAL POSITIONING

In addition to tilt-up accessories which have been used and proven on thousands of conventional as well as unusual projects in this field, SUPERIOR also provides the *system* for the entire job, from original planning and layouts, to the final positioning of the precast panels.

As the pioneer in this field, SUPERIOR has recently developed a special Stress Equalizer for reducing lifting stress in tilt-up panels of over 20 ft. high. It offers two advantages: (1) Less concrete reinforcing steel is required for stresses which occur at time of lift; (2) Permits use of simplified crane rigging.

On your next tilt-up job, avoid expensive crane delays, be assured of safety, and reduce overall costs! Specify the SUPERIOR System.

For details request a copy of Bulletin TU-3.

# SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (Suburb of Chicago)

Pacific Coast Division Office and Factory: 2100 Williams Street, San Leandro, Calif.

New York Office: 39-01 Main St., Flushing 54, New York

Houston Office: 4101 San Jacinto, Houston 4, Texas



#### **Drive for Belt Conveyors**

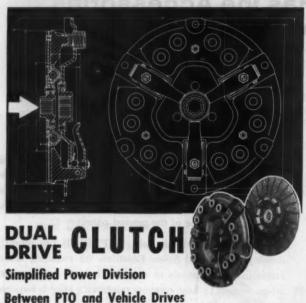
A wide variety of horsepower ranges is available for Barber-Greene's new line of torque-arm belt conveyor drives. The drives are assembled, aligned, adjusted, and tested at the factory.

A V-belt drive transmits power directly from the overhead motor to the double-action reducer. The reducer and V-belt sheaves accomplish all speed reduction. An innovation is the placement of the V-belts between the head pulley and the reducer, instead of outside the reducer. Alloy steel helical gears make up the reducer. When installed in reversible conveyors, the reducer runs in either direction. The gears are fully protected and run in oil. A cover for inspection, maintenance, and repair can be removed without disassembly or draining the oil.

The motor is attached to the support by four bolts. It is accessible from the conveyor walkway. Accessories for these drives include backstops, swivel spouts, belt scrapers, and discharge hood.

—Barber-Greene Co., Aurora, Ill.

# BOOBDOBD





Small



Heavy Duty



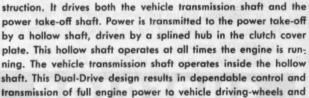
Oil or Dry Multiple Disc



Heavy Duty



Take-Off-



This is a foot-controlled, spring-loaded clutch of rugged con-

power take-off.

SEND FOR THIS HANDY BULLETIN Gives dimensions, capacity tables and complete specifications. Suggests typical applications.



Speed

ROCKFORD Clutch Division BORG-WARNER

1331 Eighteenth Ave., Rockford, III., U.S.A.

Export Sales Borg-Warner International — 38 So. Wabash, Chicago S, III.

9000000



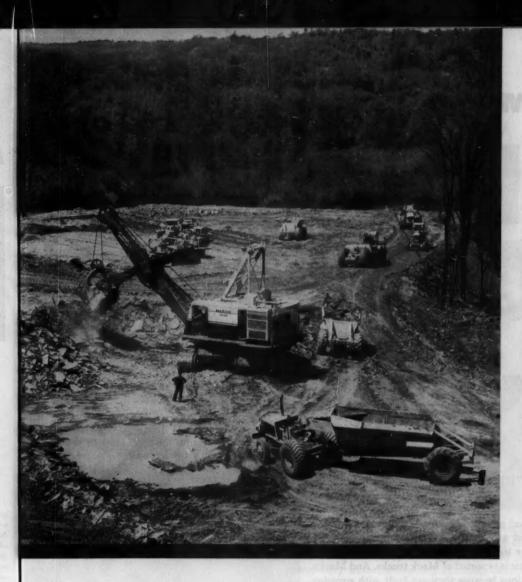
#### **Paving Breaker Muffler**

A muffler cover for pavement breakers is said to cut noise 55%. It consists of two jackets heavily lined with soundproofing materials. The muffler is zipped into place; it requires only a few seconds for installation. — W. A. Plummer Manufacturing Co., Los Angeles 14, Calif.

#### Scraper is More Rugged

Braces and support ribs at the welds have been added to give increased strength to Caterpillar's No. 463 Series C scraper.

This crawler - tractor - drawn scraper has a struck capacity of 22 cu yd and a heaped capacity of 29 cu yd. The previous model had an 18-cu yd struck capacity. The scraper can be used with either D8 or D9 tractors without modification. Wide-base, tubeless tires give increased flotation. Front wheels have 26.5x25 tires, and rear wheels have 29.5x 29 tires.—Caterpillar Tractor Co., Peoria, Ill.



HOW TO
MOVE A
MILLION
IN
4 YARD
BITES



Moving a million yards quickly becomes doubly challenging when the material includes quicksand, mud, hardpan, peat bogs, blue clay and rock.

It's all in the day's work for this Marion 111-M, making its mark on the Erie Thruway in Pennsylvania.

Four-yard bites and quick, cool electric swing on a diesel machine that can travel and work almost anywhere keep the big haulage units jumping.

Let your Marion Distributor show you how this and other dependable Marions can help you move - - and make - - a million.

MARION POWER SHOVEL CO. MARION, OHIO

A Division of Universal Marion Corporation

Power shovels, hoes, draglines, clamshells, cranes - - crawler, rubber and walker mounted - - ¾ to 100 cubic yards

**How MACK Performance** 

# PAYS OFF ON CONSTRUCTION

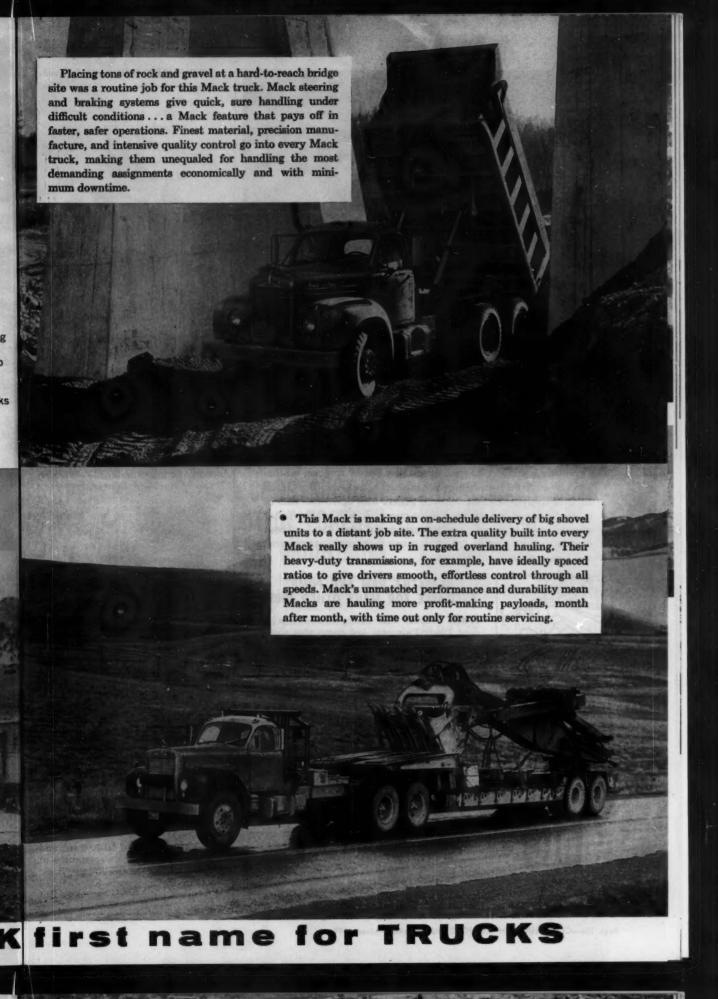
JOBS

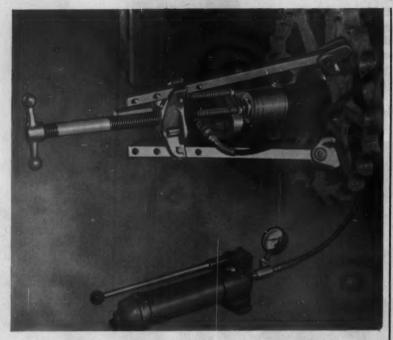
Here are three examples of Mack trucks working profitably in the construction field. Your local Mack branch or distributor can show you on-the-job performance reports that will help you choose the right Mack for your own operation. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

In diesel truck sales for the sixth straight year . . . it's MACK . . . nearly two to one!

To complete a road paving job before winter closed in, this Mack truck worked around-the-clock hauling big loads of gravel from crusher to dump site. Dependable, trouble-free performance like this is expected of Mack trucks. And Macks live up to expectations because they are built with superior components that give superior performance. Typical is Mack's exclusive Balanced Bogie with Power Divider that assures maximum flexibility, minimum tire wear, uniform braking and positive traction over any terrain.

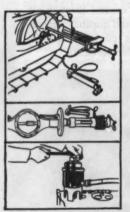
MACKfi





# One man pulls sprocket in minutes... on-the-job...with OTC puller-installer

One man, in minutes can pull or install a tractor sprocket on-thejob with an OTC hydraulic puller-installer set. Saves hours, even days, of costly down-time. Special pullers with up to 100 tons of hydraulic power are designed in co-operation with major tractor manufacturers to do all types of maintenance jobs—fast—without damage to parts. One basic hydraulic unit with special attachments will handle a variety of tractors.



#### VERSATILE RAM AND PUMP AVAILABLE FOR MANY OTHER JOBS

Track Master Pin being removed with same Power-Twin ram and pump plus accessories. Pin is removed—installed in minutes. Hand, electric or gas driven pumps available.

Truck Axle Tube being removed with OTC Hydraulic unit and accessories. Same unit installs tube — fast — without distortion.

Valve Seat Insert being pulled with 17½-ton Power-Twin ram and pump. Takes little effort and does not damage cylinder head. Three sizes fit most engines.

See your OTC Distributor or write-





#### **Portable Compacting Tool**

This portable compacting tool is self-propelled by its own action, the operator only has to guide it. It is 44 in. high and 13 in. wide. Weight is 115 lb.

A3-hp air-cooled engine powers the unit. The shoe has a 3-in. stroke and delivers 450 to 600 blows per minute. The VR 100-C Vibro-Rammer will compact any type of backfill material.—Wacker Corp., Hartford, Wisconsin.



Soi

the

#### Stronger Loader

A larger frame and thicker lift arms make the new Davis 99 hydraulic loader 15% stronger than previous models. The improved loader, with a capacity of 2,000 lb at half height and 1,500 lb at full height, fits utility tractor models made by Massey-Ferguson, Ford, International Harvester, Allis-Chalmers, and Oliver.

Breakaway power of lift arms on the rig is 2,500 lb. The loader has a 10-gpm pump and an operating pressure of 2,150 psi. It has a clearance of 10 ft, 2 in., and the bucket reaches a maximum of 56 in. in front of the tractor. Basic model in the No. 99 line is fitted with a single dump cylinder. But deluxe models have twin dump



New Frontiers in British Columbia Wilds...

#### TREACHEROUS ROAD CONSTRUCTION TEARS DAYLIGHTS OUT OF FORESTS IN VANCOUVER ISLAND MOUNTAINS

"Spectacular" is a word often used to describe the majestic splendor of the remote Muchalat logging lands around Nootka Sound on the West Coast of Vancouver Island, B.C. "Spectacular" is another name, too, for the performance of this load-hungry American 500 series crawler that's tearing into the heart of these dense forests by opening up a logging road for Stoltze Logging, Ltd.

#### SPECTACULAR PERFORMANCE with the American 500 Series

- Ultra-smooth SAFE AIR CONTROL
- . FAST, POWERFUL Grab-free SWING
- INDEPENDENT One-purpose SHAFT ASSEMBLIES
- ANTI-FRICTION Power Saving BEARINGS
- Large BRAKES AND TANDEM BAND CLUTCHES
- Roomy FOR INSPECTION AND SERVICE
- RIGID, Well balanced DECK



In full view . . . in full command of every move, veteran operator Bill Parker handles this cliff-hanging road job with complete confidence and authority. In any kind of road building work, American's can be counted on for safe, superior service.

SEE FOR YOURSELF . . . Ask the next American owner or operator you see to give you on-the-job facts. Then contact your American dis-tributor. He has complete detailed and illustrated catalog information on American's entire line of crawler and truck cranes and excavators ready to serve the construction industry.

#### Serving the Construction Industry for Over 75 Years

EXCAVATORS - CRANES to 2 yds.-60 tons LOCOMOTIVE CRANES to 130 tons

DERRICKS-HOISTS to 800 tons

REVOLVER CRANES to 400 tons

#### AMERICAN HOIST

and Derrick Company

St. Paul 7, Minnesota

Special materials handling equipment

AMERICAN HOIST CROSBY-LAUGHLIN Drop forged fittings for wire rope-chain



"Transite Sewer Pipe gives us the maintenance-free results we want...no root trouble, no infiltration, and no breakage in service."

... says James D. Halwarz
Superintendent of Water
and Sewer Dept.,
Winchester, Mass.

"And because of its ease of handling and speed of installation, our final costs are less than with other materials," Mr. Halwarz continues. "We first started using Transite in 1935 to eliminate the cleaning of water mains. We liked it so well that less than a year later we started to use Transite Sewer Pipe. In over twenty years of using it, we have yet to clean or replace a single length of Transite Sewer Pipe. Transite is specified for both water and sewer mains in the town of Winchester."

Each year, in every part of the nation, we see significant increases in the use of Transite® Sewer Pipe. To find out why, send for the new Sewer Pipe data kit—containing flow rates, new Transite crushing strengths, and TR-165, the informative brochure on Transite Sewer Pipe, its application and installation. Write, today, to Johns-Manville, Box 14CM, New York 16, N.Y. In Canada, Port Credit, Ontario.

Transite Ring-Tite® Coupling . . . tight, lasting seal against roots and infiltration of ground water.





JOHNS-MANVILLE

cylinders along with brackets for attachment of the loader to Davis hackhoes

Other new equipment includes the 101 and 102 loaders. These are the deluxe models of Davis loaders. Also available is a Davis 220 backhoe. It features five digging positions. One man can move the digging assembly along the frame to any one of the five positions in less than five minutes. The operator's seat and controls move with the digging assembly. The unit's breakaway power is 14,000 lb.-Massey-Ferguson, 1009 S. West St., Wichita, Kan.



#### Aluminum Trar Mixers

New aluminum Transcretes, made of special abrasion-resistant aluminum alloy, weigh approximately one-third less than comparable steel models. The weight of a 7-yd aluminum Transcrete is approximately 4,600 lb compared to 7,000 lb for similar 7-yd steel models. All parts of the new Transcretes are aluminum except the drive train. - Construction Machinery Company, Waterloo, Iowa.

#### Flame-Cutting Tips

Airco's new line of flame-cutting tips is designed for use with natural gas and propane. The tips come in style 260 straight bore and style 360 divergent hi-speed. They are specifically designed for use with standard Airco 3000 and 9000 hand cutting torches, 3700 and 3800 hand cutting attachments, and 4700 machine cutting torches.

The straight bore tips are available in seven sizes for manual and machine cutting of thicknesses up to 12 in. Divergent hi-speed tips are available in eight sizes for machine cutting.-Air Reduction Sales Co., 150 E. 42nd St., New York 17, N. Y.



#### YOU GET-EVERY FORM YOU NEED FROM ONE DEPENDABLE SOURCE

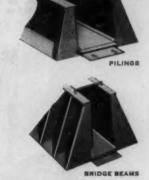
The Form-Crete line basic forms represents the most versatile group of steel forms ever produced for casting prestressed and precast concrete products. Each form has been carefully designed to insure a uniform, smooth product with every pour. Heavy-gauge steel construction means longer form life. What's more, many Form-Crete forms can be quickly adapted to produce a variety of finished products. And where special needs call for custom forms, FMC has the know-how and facilities to turn them out quickly and efficiently.

#### YOU GET-FAST, ON-TIME DELIVERY

Two modern plants, Lakeland, Florida in the east and Riverside, California in the west, have when you need them. Shipments can be scheduled to meet your requirements. Call on Form-Crete, rely on Form-Crete for the finest in all-steel forms all the time.

#### YOU GET-EXPERIENCED ENGINEERING ASSISTANCE - FREE

Long known as the pioneer manufacturer of all-steel forms, Form-Crete engineers have years of valuable experience to offer you. This free enginering service is made without cost or obligation. Oftimes a standard form can be modified to meet your needs. And if a custom unit is required, Form-Crete engineers have the knowhow to produce it for you in the shortest time.



**NEW! FROM FORM-CRETE!** SINGLE T SLAB



Single T permits castings with slabs six or eight-feet in width. Special design feature permits form to be swung back slightly, allowing easy remo ore informatio



Putting Ideas to Work

orm-Crete Department

General Sales Offices:

Lakeland, Florida - Riverside, California

FOOD MACHINERY AND CHEMICAL CORPORATION **FORM-CRETE Department** 

LAKELAND, FLA. . RIVERSIDE, CALIF. Please send me your Form-Crete General Catalog

Please send me information on the new Single T Form

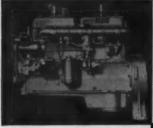
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# IN VERSATILITY MARION TRUCK-CRANE

with two

# IMES **ENGINES**



owering the Carrier-145-GKB Waukesha Gaseline, six cylinders, 51/4-in, x 6-in., 779 cu. in. displ.

Powering Crane (boom) — 140-GK Waukesha Geseline, six cylinders, 4½-in. x 5½-in., 525 cu. in. displ.



Leonard Bros. Transfer of Miami-one of Florida's largest truck-crane users—has worked a wide variety of jobs quickly and profitably with their Marion Type 43-M mobile truck-crane. The upper frame has a Waukesha 140-GK Engine and Twin Disc torque converter; the Henderson Carrier has a 145-GKB Waukesha Engine. The truck crane is shown unloading a 2700 hp Diesel engine from railway flat cars to carry-all truck, later unloaded at power plant in Sebring, Florida. The huge engine with its two components, weighing 341/2 tons and 311/2 tons, took two separate lifts. Seven parts of line were used with the 43-M's basic 30 ft. boom working at a close radius. Get Engine Bulletins 1548 and 1553.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN TULSA LOS ANGELES NEW YORK

Factories — Waukesha, Wisconsin, and Clinton, Iowa

#### **EQUIPMENT NEWS...** continued



#### **Lightweight Crane** For Truck Mounting

A truck-mounted crane elevates. turns, and extends hydraulically. The Fococrane mounts in a 13-in. space between the cab and truck bed. It telescopes and folds out of the way when not in use. The crane weighs 1,200 lb.

Two safety valves on the crane prevent overloading, and two hydraulic legs prevent tipping. The control valve bank is constructed to allow the addition of other hydraulic circuits for accessories such as hydraulic grabs and clamshell buckets. The model F-4400X lifts up to 2.2 tons. The lifting height is 21 ft with boom fully extended to 15 ft 3 in. It has a swing angle of 270 deg .-Focowil Corp., 79 West Monroe St., Chicago, Ill.



#### Pneumatic Concrete Gun

This Blastcrete gun is a rig for pneumatic application of concrete. For operation only a supply of compressed air is needed.

The model PM-2-TM is mounted on two automobile tires and wheels. Most pickup trucks can easily tow the unit into operating position. The rig can be loaded directly from transit-mix equipment.—Blastcrete Co., Inc., 323 58th St., Los Angeles, Calif.

# **How Perfect Circles**

are engineered for

# SEVERE DIESEL SERVICE

Precise pressure and pre-seated hard, solid chrome doubles life of rings and cylinders.

#### PRECISE CONTROL

of correct ring pressure distribution for any particular type engine plus a preseated surface on ring face assures long life and eliminates tedious break-in period.

#### SOLID HARD CHROME PLATING

on face of compression ring reduces the rate of wear to one-fourth that of unplated rings.

#### CORRECT FACE DESIGN

on compression ring, tailored to specific applications, prevents blow-by and scuffing, yet provides immediate oil control.

#### CHROME 86 OIL RING

features solid chrome plated faces to resist extreme high diesel pressures without scuffing or scoring. The result: thousands of hours of positive oil control and double life for pistons, rings, and cylin-

INSURE SATISFACTORY PERFORMANCE-Install Perfect Circles on all re-ring jobs and all overhauls.







In Canada: Don Mills, Ontario

Hagerstown, Indiana

June 1959-CONSTRUCTION METHODS and Equipment-Page 211



## "Nothing takes the gambling out of building like TORQMATIC DRIVE"

Little wonder so many contractors refuse to take chances on any other make automatic drive. They know how TORQMATIC's *proved* performance—in more than 10 years of tough, on-the-job use—really pays off.

In ankle-deep mud, for example, TORQMATIC equipment doesn't bog down, its wheels spinning. On tough grades, it keeps climbing where stick-shift haulers falter. And more nimble TORQMATIC earthmovers and dumps meet tighter schedules by handling more trips a day.

What's more, TORQMATIC rigs have exceptional staying power. They need no pampering—have amazingly few repair needs. It's one big reason for rock-bottom operating figures that make a TORQMATIC-handled job more profitable.

Reason enough, then, for making your next new equipment TORQMATIC equipment. It's the hydraulic drive that's outproved all others. And it's available in almost every make and model equipment you can use. See your dealer—or write:

Allison Division of General Motors, Indianapolis 6, Indiana In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

Allison TOROMATICO DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT



you can replace the damaged parts!

Yes, PM Barricade Kits give you the most flexible replacement system ever devised for barricades. You just replace the damaged part and your barricade is back in business! An extra job profit of 35.00 per barricade per onth for you!

PM Transistor Neon or Incandescent Flasher Warning Lights put profit in your pocket, too! They're lighter, brighter, require less maintenance.

Write for free demonstration. There's a PM Field Engineer near you.



Manufacturers of the Thomas Electronic Organ

#### **Useful Information**

These Construction Methods reprints contain valuable information for contractors.

BAILEY BRIDGING 75 deach

PRODUCING AGGREGATES 60é each, 10 or more, 50é each

How to Get the Best Results EARTHMOVING-

An art and a science CONCRETE MIXING AND PLACING 50¢ each, 10 or more, 40¢ each

PRESTRESSED CONCRETE 35¢ each, 10 or more, 25¢ each

CONTRACTORS' INSURANCE 25¢ each, 10 or more, 20¢ each

BLASTING AGENT SLASHES POWDER COSTS 25¢ each

Send your request to: Editor **Construction Methods** & Equipment 330 West 42nd Street New York 36, N. Y.

EQUIPMENT NEWS . . . continued



#### Sturdier Crawler Crane

Improvements in Northwest's 18ton crawler crane include a new independent worm boom hoist; power load lowering; longer, wider crawlers; larger drums with greater cable capacity; larger drum brakes and clutches; larger uniform-pressure swing clutches; an improved clutch control; and grouped lubrication.

The rig will be available as a 3/4-yd shovel, standard crane, dragline, and pullshovel. It will be called the Northwest 25-D .-Northwest Engineering Co., 135 So. LaSalle St., Chicago, Ill.



#### Diesel Electric Plant

An addition to Jeta's line of electric generating plants is a 60-kw diesel unit. This model CD-6018 is a three-phase, 60-cycle set. Its output is 120/208 volts ac. Standard equipment includes 24-volt starting and battery-charging sys-

A water-cooled, six-cylinder diesel engine powers the unit. It has a speed of 1,800 rpm. The coupled engine and generator assembly is mounted on a fabricated steel base.

All controls and instruments needed for operation of the unit are included in a completely enclosed control panel mounted as a single unit. Other items of the Jeta line range from small 3-kw, air-cooled units to large 600-kw plants.-Jeta, Inc., Yonkers, N.Y.



HOSE ACCESSORIES COMPANY PHILADELPHIA 32, PENNA.

#### Cleveland 'J' digs 20/m through scored pavement

#### **V** Conveyor

...permits faster, higher spoil discharge, higher heaped loads without clogging.



#### Hydraulic Conveyor Shift

... permits digging past poles, trees, etc., without interrupting other operations.



#### **Independent Hydraulic Drive**

... controls conveyor speeds and direction of discharge.

#### Hydraulic Crumbing Shoe

... optional, extra... pivots upward... allows setting wheel to required depth as walks, drives, underground obstructions.



# World's Finest Trencher Crawlers

operator's seat,

...double flanged sprockets, wheels, rollers...drives on each end of 1½" diameter hardened pins...eliminates plugging...sealed ball and roller bearings...1,000-hour lubrication...a tremendously long-lived, easy-rolling track.

This Cleveland J-20, digging for

4 and 6-inch pipe on a Colorado

utilities job, averaged 20 feet per minute as it cut through scored

pavement and 8 inches of frost.

Note the clean neat cut through paving and frost. Contractor's re-

port indicates he was particularly

pleased with the J-20's easy maneuverability as well as its high production on this job. All operations

of the J-20 are controlled at the

Get Bulletin L-104 on Cleveland "J" trenchers from your local distributor ...or write:



#### The CLEVELAND TRENCHER co.

20100 ST. CLAIR AVE. . CLEVELAND 17, OHIC



Everywhere

**EQUIPMENT NEWS...** continued



#### Cable Dump Trailer

The new Hobbs A-9000 cable dump trailer weighs only 5,300 lb. It is frameless and has a single axle. Its capacity is 12 cu yd, and the rated payload is 40,000 lb.

The frameless construction utilizes U-shaped ribs welded to the body shell. The floor of the body slopes downward and to the rear. It takes only 10 to 12 seconds to raise the body to a full dump angle from a level position.—Hobbs Trailers, Fort Worth, Tex.



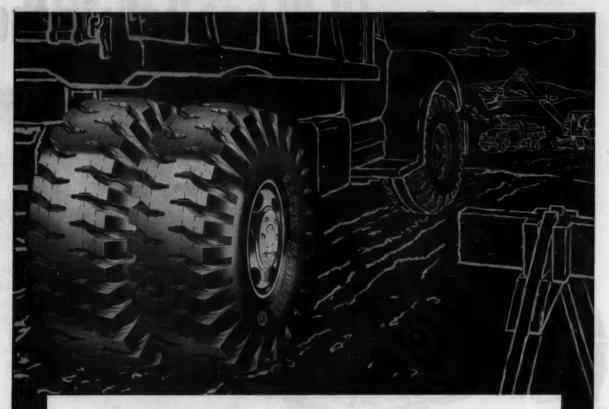
#### Dual-Drum Roller Has Wedge-Shaped Feet

Wedge-shaped tamping feet on the roller penetrate and withdraw from loose fill with a minimum of disturbance of the fill material. The 170 tamping roller consists of two drums with an overall width of 11 ft 1 in. Each drum has 120 tamping feet arranged in 20 rows of six feet each.

The drums weigh 17,150 lb when empty and exert a pressure of 207 psi at the tamping feet. When 75% filled with sand and water the drums weigh 30,680 lb, and the pressure is 373 psi.

The unit can be dismantled for transportation by removing only 16 bolts. All moving parts have pressure lubrication fittings. The roller has a hitch at the rear of the frame for tandem operation. It is also available with non-directional tamping feet. This model, the 170-A, weighs 2,000 lb less than the 170. — Koehring California Co., Stockton 4, Calif.

# NEW STRENGTH, NEW DRIVE CUT COSTLY DOWNTIME



# New Cross-Lug U. S. Royal Fleetmaster Dual-Purpose-Nylon beats the tire hazards that can wreck tight schedules!

Contractors all over the country are finding out that using this great new U.S. Royal Fleetmaster Dual-Purpose reduces job delays due to tires. Its 52% stronger body, of exclusive Double-Strength Nylon cord, defies impacts that ruin ordinary tires. Its big, deep cross-lugs dig in for 35% greater

traction, prevent spinning wheels, bogged-down trucks, broken schedules. See it for yourself. Call your U.S. Royal Dealer right now. And make sure to specify "U.S. Royal" on the next new equipment you buy! Available in tubed or tubeless construction.

# U.S. ROYAL TRUCK TIRES

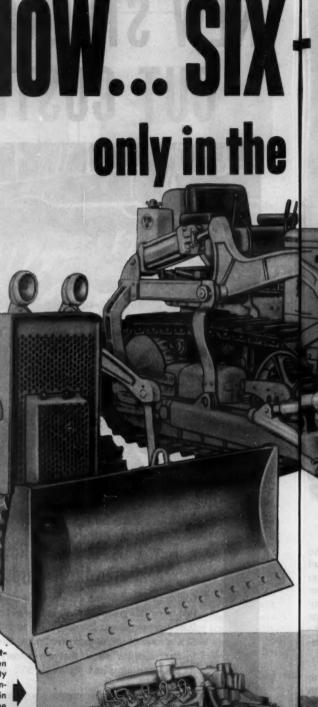


New TD-6 "62 series" diesel, 52 net engine hp. Operating weight (50-in. gauge), 8,665 lbs. Pulls 8,715 lbs. at rated rpm. Powers 8' 10½" Hydraulic Bullgrader shown; 1½ cu. yd. International Drott 4-in-1; other similar equipment. Available with 4- or 5-roller track frames. Five forward, one reverse, speeds. (Two-speed reverse, optional.)

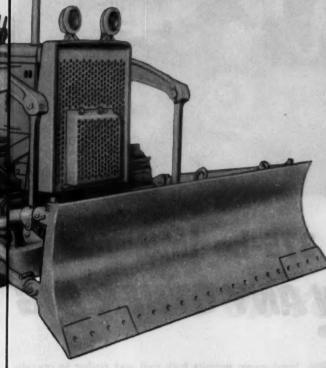
New TD-9 "92 series" diesel, 66 net engine hp. Operating weight (60-in. gauge), 11,430 lbs. Pulls 11,720 lbs. at rated rpm. Powers 7' 11%" Hydraulic Bulldozer, shown; 1½ cu. yd. International Drott 4-in-1; other similar equipment. Available with 4- or 5-roller track frame. Five forward, one reverse, speeds. (Two-speed reverse optional.)

Millions of hours of profitable performance have proven the reliability and work capacity of the D-282 6-cylinder diesel engine. It's naturally-aspirated in the TD-6; turbocharged in the TD-9. Direct-electric started, this fast-governed performer features the most simple, efficient, and compact rotary-type fuel-injection pump built! Other D-282 long-life, low-upkeep features include: trimetal main and connecting rod bearings; file-hard, replaceable cylinder sleeves; and extra power from every ounce of fuel energy put to work with a new superswirl piston face.

New 500-hr. lube interval TD-6 and TD-9 track rollers are of heavy-duty International design. Heavy-duty roller bushings are supplied from big 300% increased lube reservoirs. Exclusive vented shofts in top and front idlers, and in track rollers protect the seals from over-lubrication.



# CYLINDER : smoothness : capacity : operating dividends NEW TD-6 and TD-9!



Smooth, high-torque 6-cylinder diesel power make the new TD-6 or TD-9 ideal clean-up dozer units on any sized contract; or main-producing units with dozer or excavator-loader on many sizes of jobs!

Now you get the smoothness, the high-production power wallop, the dependability of a fully-proven, fuel-thrifty 6-cylinder International diesel engine—only in the new TD-6 and TD-9 crawlers. This high-torque diesel has direct-electric starting; simple, compact, rotary-type precision fuel injection!

New TD-6 and TD-9 crawlers have exclusive vented shafts in track rollers, and top and front idlers, to assure positive seal protection from overlubrication. And newly-designed track roller shells have a big, 300% increased lube capacity, to make 500-hour lube intervals a practical reality!

Both of these versatile new models have the power-transfer efficiency, and all-temperature workability of new dry-type, full-face sintered metal engine clutches. Choose from a proven line of dozers, loaders, and other equipment to take full advantage of TD-6 or TD-9 six-cylinder power!

From direct-start button to heavy-duty radiator guard, new TD-6 and TD-9 crawlers practically put their new production boosting advantages under "touch control." Let a "no-holds barred" competitive demonstration prove how easily you get their big bonus margin of earning capacity. See your International Construction Equipment Distributor!



Here's the sintered metal engine clutch driven member—for TD-6 and TD-9 crawlers. New full-face design provides smooth mating of surfaces, gives the holding power and heat defiance for full-torque performance. And you get all the other advantages of dry-type clutch simplicity and low upkeep!



International Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, III.

A COMPLETE POWER PACKAGE: Crawler and Wheel Troctors...Self-Propelled Scropers and Boltom-Dump Wagons...Crawler and Rubber-Tired Loaders...Off-Highway Haulers...Diesel and Carbureted Engines...Motor Trocks ...Farm Tractors and Equipment.





# Here's why a NEW 375-hp International Ea CAN OUT-EARN ANY OTHER BIG W

In the new 27 cu. yd. 495 Paywagon®, big earning advantages start with the new International DT-817 diesel engine. Forty-ton payloads highball upgrade or over rough and soft spots faster than ever behind the locomotive-like wallop of 375 turbocharged hp-more power per struck yard than any comparable wagon! Next, the "495" Paywagon's exclusive power-opened clamshell doors give positive dumping control-and retract parallel with hopper sides-"clean as a whistle" from wiper plate action! Pull-away clearance, to straddle 60"-high windrows, eliminates dumping delay! Too, the 495 Paywagon has new full 90° turning in either direction; new road-hugging design to gain top mph safely, out and back, at speeds up to 32.0 mph. Plus exclusive extra operator comfort and control features that reward you with extra production!

In the new 24 cu. yd. 495 Payscraper,® exclusive International DT-817 diesel power earning advantages team up with new cutting width and tapered bowl design-to heap-load faster than any other 3-axle scraper of its size. And it hauls at speeds up to 32.0 mph! The scraper's big 131" cutting width promotes fast dirt

break-away, permits both unit and pusher to operate within the cut for best traction. Exclusive tapered bowl design boils dirt toward center, reducing side spillage; permitting positive, forced ejection even of sticky or frozen materials. More hp per struck yard than any competitive unit-wheel and bowl leveling adjustment -custom-designed cable control unit-full 90° turnsall team up to make the 495 Payscraper the top producer of its size class!

In the new 24 cu. yd. 295 Payscraper-you get the same big-capacity, high-torque engine that powers the 495's: the 375 hp DT-817! You get haul speeds up to 29.1 mph-matched with new automotive comfort and control features, that include a 16-adjustment seat. And the scraper unit of the 2-axle 295 is the same heaploading, tapered bowl, wide-cut scraper featured in the 495 Payscraper!

Match any new International Earthmover against any similar equipment on your job or in your mindfor capacity, operating ease, low costs and net profit earning ability. See your International Construction Equipment Distributor!



# Earthmover Earthmover Representational Paywagon highballs 40.5 cu. yd. (or 40.5 tons) as fast as 32.0 mph. Choose either 4-speed Power Shift or 9-speed constant mesh transmission drive.



Controlled with new custom-designed cable control unit, the 375 hp International 495 Payscraper speeds 34 cu. yd. heaped loads up to 32.0 mph. Its apron can "gape" open as high as 98"—for sure ejection of all materials!

Positive-acting air brakes—16-adjustment spring hydraulic seat—unobstructed vision—flush-deck safety power steering—all add up to production-boosting operator comfort and ease of control of the new 375 hp 295 Payscraper. Heaped capacity: 34 cu. yd. Max. speed: 29.1 mph.



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International Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, III.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors...Self-Propelled Scrapers and Bottom-Dump Wagons...Crawler and Rubber-Tired Loaders...Off-Highway Haulers...Dlesel and Carbureted Engines...Motor Trucks...Farm Tractors



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in NEW TD-6 and TD-9 crawlers!

NEW 6-cylinder diesel smoothness and power wallop! Both the new TD-6 and TD-9 Four-in-One's are powered with the millions-of-hours-proven, direct-starting, 6-cylinder International UD-282 diesel. Naturally-aspirated in the TD-6, it produces 55 net engine hp; turbocharged in the TD-9, it delivers 71 net engine hp!

New job-getting efficiency! Both the new TD-6 and TD-9 Four-in-One's have increased track length, for new toughjob stability and flotation. Both are geared with new speeds for greater tough-job capacity. Both have the power-transfer efficiency of new fullface, sintered metal engine clutches.

And both the new TD-6 and TD-9 have exclusive vented track-roller and idler shafts, assuring positive seal protection from over-lubrication. Big 300%-increased lube capacity shells provide 500-hr. track-roller greasing intervals!

Move the selector lever! Prove versatility unlimited of exclusive 4-in-1 as Skid-Shovel; space-saving, bottom-dumping clamshell; full-sized bulldozer; inch-close-accurate "carry-type scraper." Add up how many tens of thousands of dollars a new TD-6 or TD-9 four-inone can save you, doubling for one limited-duty rig after another! Measure the plus value of exclusive shockswallowing Hydro-Spring. See your International Drott Distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois Drott Manufacturing Corp., Milwaukee 15, Wisconsin

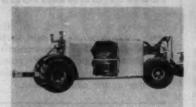




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DROTT

New 1% cu. yd. International Drott TD-6 Four-in-One. New TD-9 Four-in-One has 1½ cu. yd. bucket capacity.



#### Water Wagon

Two new water wagons apply compaction water in street and highway construction. The model 300 Clark Water-Cator has a capacity of 3,000 gal; the model 580 has a 5,800-gal capacity. Other tank sizes are also available.

The water wagons are adaptable to fit any make truck-tractor with sufficient power. The units can be fitted with either two or four adjustable spray heads with positive shut-off and direction and volume control. A self-cooling, hydraulically driven pump is submerged in the tank. A control valve located in the cab regulates the water flow.-Koehring Co. of California, 2200 Country Club Blvd., Stockton 4, Calif.

#### Portable Electric Plant

The Master portable de electric plant has a rated capacity of 2,-500 w for intermittent duty. For continuous duty it is rated at 1,500 w. The unit is available in either 115 or 230-volt models. The weight is 177 lb.



A 6-hp, 4-cycle Wisconsin engine is direct connected to the compound wound generator. A hand rheostat controls the voltage. The generator has a rubber mounted voltmeter.-Master Vibrator Co., 266 Stanley Ave., Dayton 1. Ohio.



#### Mobile Dust Collector

Standard's new cyclonic wet washer is a highly mobile dust collector for asphalt hot mix plants. The unit is especially designed for use with Standard's model S-E self-erecting asphalt plant. The wet washer is ready to operate after connection of an inlet duct and the placement of a light stack extension.

The dust collector is complete with spring-mounted wheel and axle assembly, jack legs, and air brakes .- Standard Steel Corp., 5001 South Boyle, Los Angeles 58, Calif.

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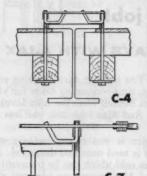
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#### **New Publications**

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

MASTER BUILDERS BOOK-LETS - Three new publications are available from the Master Builders Co. Bulletin X-5A, entitled "Product Data Guide," covers the usage of all major Master Builders concrete and masonry products. Bulletin O.M.-8A, entitled "The design and Specification of Watertight Masonry," discusses mortar ingredients and proportioning, compatibility of brick and mortar, control of shrinkage and bleeding, separation crack, effect of mechanical disturbance, and the importance of proper protection, Bulletin Eld, entitled "Non-Shrink Grouting," explains how to avoid grout shrinkage by using proper mixtures.-The Master Builders Co., Cleveland 3, Ohio.

PIONEER BOOKLETS — Two new publications are available from Pioneer Engineering. A 6-p folder describes the Model 32-S intermediate size portable duplex plant. A 16-p booklet, form 651A, describes the line of heavy-duty Mesabi screens. — Pioneer Engineering Division, Poor & Co., Minneapolis 14, Minn.

ARMCO PRODUCTS—Armco has issued three new bulletins. Form PS-14258, on the subject of Hel-Cor pile sheels, covers speed of installation, strength and economy, and steps in mandrel-driving. Catalog FP-13558, entitled "Armco Foundation Products," describes pipe piles, caissons, and Hel-Cor pile shells. Manual TL-7858 describes tunneling practices with Armco liner plates.—Product Information Service, Armco Drainage & Metal Products, Inc., Middletown, Ohio.

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CRANE CATALOG—Bulletin No. 350-1 gives complete specifications, capacities, work ranges, and features for the Schield Bantam 11-ton carrier-mounted Model T-350, the 11-ton self-propelled Model CR-350, and the Model C-350 crawler-mounted Bantam, as



## **CLARK PLANETARIES END AXLE TROUBLES** FOR ARIZONA CRANE OWNER

Like many contractors, this Flagstaff (Arizona) crane owner used to consider broken axle shafts part of the game. All too often, one would crack or snap, and a lot of time and money would go down the drain.

Then the company bought a crane equipped with Clark planetary axles, front and tandem-rear. Their work pace continued, even grew. Ten to 20 hours a day, six days a week. Thousands of poles and pipe sections to unload and place. Bridge sections to set. Concrete to pour. 35 to 40 mph job-to-job travel required.

That's been the picture for two years now. There hasn't been an axle failure—or even a hint of trouble! Clark planetaries, by taking 70% of the torque load off the shaft, have reduced strains that effectively!

Why not specify these money-savers in your next truck-crane. Drop us a postcard; we'll be glad to tell you what crane makes and models include Clark planetaries as either standard or optional equipment.





4 sizes: 28,000 to 120,000 lbs ground loading capacity. Available in single or tandem couplings.

#### Shovel owners boost efficiency with Clark Torque Converters



For smooth power, easier handling, elimination of shock-loading, reduced wear on power train, most makes of excavators can now be equipped with Clark torque con-

This Marion ¾ yd shovel, for instance, has a Clark Model 10-13AKFG torque converter behind its GMC diesel engine.

Owner M. A. Biggerstaff reports less down-time with the machine than with any other shovel he's ever had . . . despite the tough job of shot-rock loading it's been doing for the past two years.

#### FOR FURTHER INFORMATION . . .

and full details on any of Clark's automotive components, simply address a card or a call to:

CLARK EQUIPMENT COMPANY AUTOMOTIVE DIVISION buchanan 6, Michigan



## Bethlehem Beam Guard Rails-Strong Steel Barriers off the Highway

Builders of off-highway automotive installations, like this new car test track at Chrysler Engineering Proving Grounds, are finding Bethlehem steel guard rails ideal as protective barriers.

Other non-highway applications include parking lots, parking garages, driveways and other traffic control areas, and pedestrian walk-ways.

The same advantages of steel beam guard rail that make it so vital a part of modern highway construction apply to uses off the highway: strength, pleasing appearance, low maintenance, good visibility, and safety.

#### New Bethlehem Booklet Available

Just off the press is a new Bethlehem booklet describing the uses of both Bethlehem Safety-Beam and Bethlehem Beam Guard Rail off the highway. Test and assembly data and specifications are included.

A free copy of this informative booklet is yours for the asking. Just address your card or letter to the nearest Bethlehem Sales office, or direct to Publications Department, Bethlehem, Pa.

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well as the complete line of attachments.—Schield Bantam Co., Waverly, Iowa.

CEDARAPIDS PLANTS—A new 8-p bulletin describes two models of Cedarapids stabilized base mixers that can handle 300-600 tph of aggregate. A second bulletin describes the Wash-All Junior washing and screening plant with a capacity of 50-100 tph.—Iowa Mfg. Co., Cedar Rapids, Iowa.

EUCLID EQUIPMENT — Euclid has published two new catalogs on its earthmoving equipment. Form 511 describes the model S-18 scraper of 21-yd srtuck capacity. Form 151R4 covers the model R-10 Rear Dump of 10-ton capacity. — Advertising Department, Euclid Division, General Motors Corp., Cleveland 17, Ohio.

DIESEL ENGINES—A 12-p brochure describes the wide selection of industrial and automotive engines now available in GM Diesel's line. Entitled "Choose the Power for your Purpose," the booklet gives power ratings and dimensions for over 100 in-line, "V" and turbopower engines ranging in size from 20 to 1650 hp. — Detroit Engine Division, General Motors Corp., Detroit 28, Mich.

concrete batching — Two folders describe the latest equipment for concrete batching by Heltzel. The first, entitled "The Helco Auto-Mix," describes an automatic mix control that will eliminate the operator now required to regulate the mixing cycle. The second, entitled "Heltzel Unitized Type 100 Combination Batching Plant," describes a batch plant that can be set up in 3 hr by eight simple steps.—The Heltzel Steel Form & Iron Co., Warren, Ohio.

STUD WELDING—An 18-p brochure from Nelson Stud Welding describes how a number of aluminum sandwich walls for buildings were field assembled with endwelded studs. A chart lists the specific types of wall recommended for various conditions.—Nelson Stud Welding Division, Gregory Industries, Inc., Lorain, Ohio.

continued on page 226



UNUSUAL PERFORMANCE in operational advantages and STRENGTH in structural design, features common to all Rogers Trailers, assure long, satisfactory service.

The new HYDRAU-LIFT Detachable Gooseneck by Rogers—the pioneer builders, provides fast, dependable, versatile performance not available in any other trailer.

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#### NEW PUBLICATIONS ... continued

CONCRETE TESTING - A new folder from Soiltest, entitled "Three Basic Tests for Concrete Quality Control" shows how the slump test, air entrainment determination, and testing of concrete cylinders, are performed. Photographs illustrate the major steps in each operation. - Soiltest, Inc., 4711 W. North Avenue, Chicago 39, Ill.

LATEST ON PAINT-Up to date information on paint, methods of application, causes of deterioration, and techniques for maintenance are contained in a 150-p book entitled "Field Applied Paints and Coatings." This is National Academy of Sciences publication 653 and it contains a complete report of the Building Research Institute conference on the subject held last December. The book includes valuable articles by 18 of the nation's top authorities on paint plus a transcript of five panel discussions in which paint users posed questions for the experts to answer. Price of the book is \$5.—Building Research Institute, National Academy of Sciences. 2101 Constitution Ave., Washington 25, D. C.

CRANE CATALOGS-Five new catalogs describe Insley products. Catalog No. 200-3 covers the Type WT, 1-cu yd excavator, 25-ton crawler crane and 30-ton rubber mounted crane. Catalog 300-3 describes the Type M, 34-yd excavator, 15-ton crawler crane, and 20-ton rubber mounted crane. Catalog 192-A covers the Type WB, 11/2-yd excavator, 30-ton crawler crane, and 35-ton rubber mounted crane. Catalog 192-8A cover the 35-ton Type WB Lorry Crane. Catalog 190-B describes the complete line of excavatorcranes, log loaders, and concrete handlinug equipment, including types K, L, M, WT, WB, and the Insley 45.-Insley Mfg. Corp., P. O. Box 167, Indianapolis 6, Ind.

INFLATABLE FORMS-A booklet and chart describe the Elgood concept of forming voids in concrete with reusable rubber forms. These forms are round, come in various lengths and can be reused up to 350 times. They are inflated with air or water to 12 psi and removed by deflation.-Elgood Concrete Forms Corp., 378 Ten Eyck St., Brooklyn 6, N. Y.

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At Kansasville, Wisconsin, the new Bong Air Force Base is being rushed to completion for the Strategic Air Command. Earthmoving and paving work on this 5,440 acre base was awarded to S. J. Groves and Sons Company and is under the supervision of the Chicago District Corps of Engineers. Nearly 14 million cu. yds. of excavation will be moved prior to the contract completion date.

In spite of the tight schedule, grading is well ahead of the timetable. With 2-shift operation, efficient job management and a large fleet of modern earthmoving equipment, Groves moved 8½ million cu. yds. in 4 months. A total of 67 Euclid units... more than 3 times the number of other big rubber-tired haulers on the job... are making the dirt fly! A long-time Euclid owner, Groves acquired six Model TS-24 "Twin" Scrapers to supplement their Euclid fleet at Bong. These big scrapers, with 2 engines and all-wheel drive, can work without the assistance of pusher tractors... have already played an important part in keeping the earthmoving well ahead of contract schedule.

On big rush jobs like this one, or on smaller projects, too, modern Euclid equipment maintains high production at low cost. Have the dealer in your area give you the facts and figures that prove Euclids are your best investment.

**EUCLID** Division of General Motors, Cleveland 17, Ohio

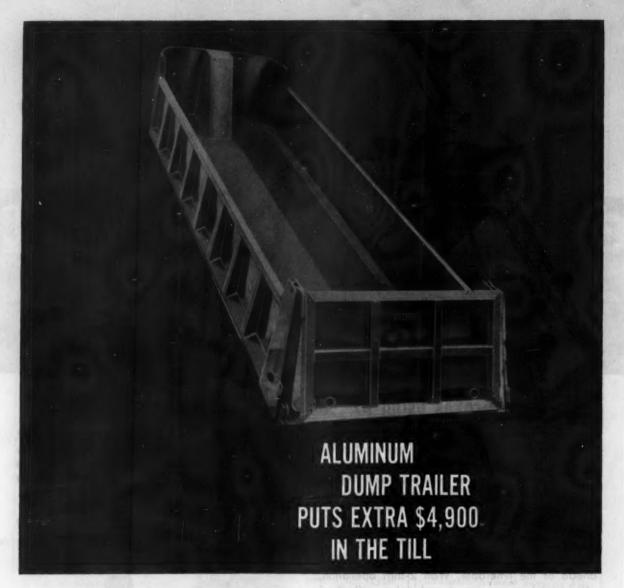


Groves is using 32 Bottom-Dump Euclids at Bong...10 have struck capacities of 13 cu. yds. and the others are 17 yd. units. Pavement-smooth haul roads enable the Bottom-Dumps to take full advantage of their fast travel speeds for high production.



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A Galion Dump Trailer is working a 72-hour week for Silver Sand Company down in Leesburg, Florida. It hauls sand, gravel and stone up to 80 miles per trip—and earns \$16 extra daily. That adds up to \$4,900 in extra earnings per year. And it is made possible because the trailer is made of Alcoa® Aluminum.

Because strong, lightweight Alcoa Aluminum reduces tare weight by 2,500 lb, that much more payload can be hauled every trip. The moderate price differential you pay for aluminum can usually be paid for in extra earnings in little more than a year. And, Silver Sand saves additional maintenance money because even moisture in the loads doesn't corrode the aluminum body. Light weight means more tire mileage, as well as a reduction in fuel and lubrication costs.

Silver Sand's Galion dump trailers feature "Advanced Design," which eliminates weight-wasting longitudinals. Additional torsional strength is provided by the integrated design of rub rails, side

braces and a special extruded aluminum top roll.

Why wait to find out how you, too, can benefit from the additional earning and carrying capacity of aluminum trailers? Details on how a number of fleet owners boosted profits by switching to aluminum are available in a case-history booklet that is yours for the asking. For your copy, write today to Aluminum Company of America, 1774-F Alcoa Building, Pittsburgh 19, Pennsylvania.



PROOF! Aluminum is tougher than steel! Dump bodies built of Alcoa Aluminum alloy can take three times as much impact as steel, at half the weight.



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#### Victim of Sidesway

Construction men move in every piece of equipment available to lift the roof of a one-story industrial building that collapsed, trapping several workers under it. One man was killed.

The steel-frame building was under construction in Westbury, N.Y. The 25,000-sq-ft roof had been completed, but work on the walls had not started when the frame gave way. The roof fell to the ground almost intact.

Best guess is that the failure was caused by inadequate bracing against sidesway. The building had continuous girders atop the steel columns and continuous beams on the girders. Girders were knee-braced to the columns, but there was no permanent bracing in the direction of the beams.

#### **Cut Rate Construction**

Wanapum Dam on the Columbia River may well be the greatest construction bargain in history. And it's a prime example of how tough competition is in heavy construction.

Engineers estimated the project at \$137.6 million. Anything close to that figure would have made it the largest contract ever let by competitive bidding. But the low bid was \$88.9 million, a cool \$48.7 million or 35% below the estimate. Even the highest of the five bidders was \$30 million under the estimate. The bidders were:

- Grant County Construction Co., a joint venture of Morrison-Knudsen Co., Kaiser, Macco Corp. Raymond International, and F&S Construction Co.—\$88.9 million.
- Northwest Dam Construction Co., a joint venture of Peter Kiewit Sons' Co., Midvalley Utility Constructors, Al Johnson Construction Co., Condon-Cunningham Co., and Coker Construction Co.—\$96 million.
- Merritt-Chapman & Scott Corp.—\$97.1 million.
- A joint venture of L. E. Dixon, Arundel Corp., Hunkin-Conkey Co., American Pipe & Construction

Co., and Guy F. Atkinson Co.-\$107.9 million.

The 8,320-ft-long earthfill dam will be 18 miles upstream from Priest Rapids Dam, now under construction. Major quantities involved are 11,000,000 cu yd of excavation, 5,000,000 cu yd of embankment, 1,000,000 cu yd of concrete, and 33,000 tons of reinforcing steel.

#### Earthmovers of the 1960's?

R. G. LeTourneau, Inc., is the first manufacturer to turn out earthmovers powered by electric motors in the wheels, (CM&E, Feb., p. 90) but several other major equipment producers are at work on machines of the future that may incorporate the same principle.

General Electric has developed an electric traction motor designed as an integral part of a wheel. It is not yet in production, but GE has built several of them for test purposes.

One big equipment manufacturer now is putting an experimental earthmover with four of these wheels through a series of tests. Several others are working to design and evaluate similar rigs. And this summer an earthmover with GE's electricpowered wheels will get a thorough on-the-job test at a big strip mine.

In the R. G. LeTourneau machines, one or two 600-hp Cummins diesels power a generator that drives electric motors in the wheels. Biggest of these rigs is a double-bowl, 130-ton-capacity scraper with eight powered wheels that loads without help from pushers.

The electric wheel idea, itself, is not new, and there are no basic patents on it. Such wheels have been built on an experimental basis since the turn of the century.

#### **Connecticut Pioneers**

The construction industry in Connecticut is making a concerted effort to recruit future construction managers. An organization called Construction and Building Industries Educational Endeavor, Inc., has opened offices in New Haven and is hard at work.

First efforts of the organization are to find summer jobs for college students who want to make a career in building. Later, it hopes to raise a fund to provide low interest student loans and grants.

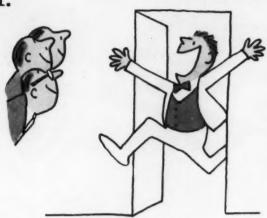
Joseph Mariani, president of Mariani Construction Co., put up the money to start the program. It now has the support of almost every construction organization in the state.

#### Our 40th Anniversary

This month Construction Methods celebrates its fortieth anniversary. It's an anniversary without hoopla—just another milestone. We believe the future of this great industry we serve is far more important than its past and that we can continue to serve it best by looking ahead.

#### Al protects his road with an umbrella

1.



"All mine!" Al Arch exploded as he tumbled through his door,
"That superhighway contract from the city to the shore!"
His men assembled round him and each took him by the hand,
Our hero felt, as you'd expect, just simply, wholly GRAND!

2.



His Travelers man stopped in to find him gazing pensively.
Said Al, "Your bond was super-fast and right as it could be,
But we push off to start at dawn, we need a covering plan!"
"We quickly handle every need," replied his Travelers man.



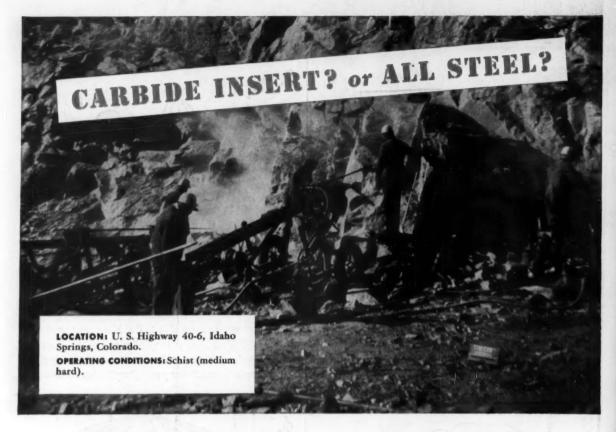
"You have our Workman's Comp and Public Liability, So if a man gets hurt, he's *our* responsibility. And our Equipment Floater is good fortune's best defense: Collision, upset, fire, theft—not yours, but *our* expense.



"And finally, our Builder's Risk Insurance can't be beat,
Protects like an umbrella till your venture is complete!"

If you've a highway in the works, be sure to check this plan,
Just make a call, he's on the ball, your able Travelers man.

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